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Recreational Conflict Is Affective: The Case of Cross-Country Skiers and Snowmobiles

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The authors conducted a field experiment to test the assumption that subjective feelings are important in recreation conflict. During a weekend, cross-country skiers in a popular recreation area were assigned randomly to an experimental group who were exposed to an operating snowmobile, and a control group who were not exposed. Both groups completed a self-report questionnaire to provide information on their subjective experiences during their outing. The experimental group answered the questions five to ten minutes after encountering a snowmobile. Participants were not informed about the connection between the snowmobile and the investigation, and the questions regarding effects were answered before any clues were given about snowmobiles being an issue. Results showed that relative to the control group, skiers who encountered a snowmobile had their affective quality significantly reduced. Moreover, encountering a single snowmobile had an effect on participants' beliefs about the extent to which noise from snowmobiles disturbed the quality of ski-touring in general.

Keywords recreational conflict, emotions, priming, snow mobile

"I can think of no other concept in psychology that is as richly revealing of the way an individual relates to the physical and social environment, and to life, as emotions." (Lazarus, 1990, p. 12)

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Increased variety in recreational activities has brought about amplified conflicts over the use of public recreation areas. Conflicts between recreational groups are among the most fundamental and intensively studied issues in contemporary outdoor recreation (Hendricks, 1995; Jackson & Scott, 1999). Attempting to understand the nature of these conflicts, leisure researchers have made some progress in theorizing the mechanisms of recreational conflicts, most evidently in models such as the one proposed by Jacob and Schreyer (1980). Based on the notion of goal inference, these authors argue that recreational conflicts are influenced by activity style, resource specificity, mode of experience and lifestyle tolerance. Other models advance the issue of recreational spheres (Lindsay, 1980) or environmental dominance and technology dependence (Bury, Holland, & Ewan, 1983). Despite the growing interest in the subjective experience of leisure, few systematic attempts have been made to understand the affective responses involved in recreational conflict.

Schneider and her colleagues have focused on the possible stress activation during a recreational conflict (Schneider, 2000; Schneider & Hammitt, 1995). Recreation experience is an explicit component in their model. Earlier, Knopp and Tyger (1972) argued that intense emotions are generated in clashes between motorized and non-motorized recreation activities. Nevertheless, to the best of our knowledge, no experimental data have been offered to reveal the emotional and affective dynamics of an ongoing recreational conflict. Hence, the main purpose of this article is to document the existence of a subjective feeling response to the asymmetrical discord between engine-propelled and self-propelled forms of recreation.

Models of Recreational Conflict

Although it is difficult to extract agreement on how recreation conflict should be defined (Watson, 1995), the majority of outdoor recreation conflict investigations have been based on Jacob and Schreyer's conceptual framework (Schneider & Hammitt, 1995). Their model is based on a definition of recreational conflict as goal interference attributed to another's behavior. Jacob and Schreyer (1980) proposed four major classes of determinants that influence recreation conflict. *Activity style* refers to the personal meaning individuals assign to the activity. *Resource specificity* denotes the significance attached to using a specific recreation resource for a given recreation experience. *Mode of experience* is a continuum of environmental focus determined by the recreation activity itself. Finally, *Lifestyle tolerance* relates to the tendency to accept or reject lifestyles different from one's own.

Despite minimal empirical testing, Jacob and Schreyer's model remains dominant in the recreation conflict literature, although recently several researchers have offered ideas to improve this original model. For instance, Schneider and Hammitt (1995) argued that more attention should be paid to visitor responses to the recreational conflict. They presented a conflict model in which stress plays an important role. Furthermore, Vaske, Carothers, Donnelly and Baird (2000) hold that perceived safety needs to be added to a good model of recreational conflict. In a large sample from five ski resorts in Colorado, these authors found empirical support for their assumption. Based on this work, the authors suggest that more work is needed to explore the relationship between traditional definitions of conflict and those currently used in the leisure literature. Accordingly, we propose that current theories of emotion and affects might contribute to an enhanced understanding of conflict in the outdoors.

Affective Responses to Conflict

Sixty years ago the concept of emotion was easily abandoned as a scientific concept, and even 25 years ago the field of emotions looked too amorphous for most social scientists to take

seriously. In other words, when Jacob and Schreyer developed their model of recreational conflict, emotion was hardly regarded as a scientific issue. Today it is argued that social science can progress without considering emotion—about as fast as someone running on one leg (Russell, 2003, p. 145). Russell's statement points to the development of both interest and convergence one can observe in this field (e.g., Lewis, 2000).

The general shift toward taking subjective experience seriously is recognized within leisure research. Since the 1980s, attention in recreation studies has shifted from participation and activity toward a more subjective or experiential emphasis (Jackson & Scott, 1999). Hence, the significance of an individual's affective state in every environmental experience has become more evident among leisure scientists. At least in theory, it has been recognized that few meaningful thoughts, actions or environmental encounters occur without affect (Ittelson, Franck, & O'Hanlon, 1976; Russell & Snodgrass, 1987).

The notion of affect is somewhat inconsistently defined in the literature. Nico Fridja, for example, uses the term "affect" synonymously with "hedonic valence" (i.e., the experience of pleasure and pain) (Frijda, 1999, 2000), whereas Diener uses it interchangeably with the term "emotion" (e.g., Diener & Lucas, 2000). The American Psychiatric Association defines it as "a pattern of observable behaviors that is the expression of a subjective experienced feeling state" (American Psychiatric Association, 1994, p. 763). However, the most common practice is to use "affect" as a generic term covering concepts such as evaluation, emotions, mood and preferences (e.g., Davidson, 1994; Fiske & Taylor, 1991; Malatesta-Magi & Culver, 1991; Oatley & Jenkins, 1996; Posner, Rothbart, & Harman, 1994; Russell & Carroll, 1999).

Russell (2003) suggested that the term "affect" should incorporate primitive and non-cognitive emotions with cognitive elements such as attributions, appraisals and goals. Similar in meaning to what is commonly called a *feeling,* affect is an integral blend of valence (pleasure–displeasure) and arousal (sleepy–activated). At any single moment, a person will have a conscious experience describable in terms of the combination of these two dimensions. The valence dimension is defined as the extent to which an individual incorporates pleasantness and unpleasantness into their subjective affective experience and it ranges from one extreme (e.g., agony) through a neutral point to the opposite extreme (e.g., ecstasy). The arousal focus is defined as the extent to which an individual incorporates subjective experiences of arousal into a conscious affective experience, and it may be associated with a tendency to attend to the internal sensations associated with an affective experience. Not all of these affective feelings are emotional (e.g., tense, calm, comfortable), but some are (e.g., elated, happy, depressed). Affects are caused by individual differences (e.g., temperament) and external information (e.g., stressors).

The concept of emotions also varies, and disagreement about its definition has been explicit for more than 100 years (James, 1884). Nevertheless, some convergence in the understanding of emotion during the last two decades has occurred, and we believe that among emotion researchers today, it is reasonable to assume that at least a certain degree of consensus exists with respect to the following working definition:

1. An emotion is usually caused by a person consciously or unconsciously evaluating an event as relevant to a concern (goal) that is important; the emotion is felt as positive when a concern is impeded.
2. The core of an emotion is readiness to act and the prompting of plans; an emotion gives priority to one or a few kinds of action on which it confers a sense of urgency—so it can interrupt, or compete with, alternative mental processes of actions. Different types of readiness create different outline relationships with others.

3. An emotion is usually experienced as a distinctive type of mental state, sometimes accompanied or followed by bodily changes, expressions, actions (Oatley & Jenkins, 1996, p. 96).

Affects are notoriously difficult to study by scientific methods, and they cannot validly be reduced to any single measure (Larsen & Fredrickson, 1999). In the absence of direct observation, assessment of affects relies on behavioral, cognitive, biochemical, neurological, and physiological indicators, among others, and self-reports. Separately none of these indicators is able to produce comprehensive measures, and most empirical studies involving affects carry information limited to one or two sets of indicators. Our study is no exception, as we concentrate on the participants' own descriptions of their affective states. To compensate for a series of systematic inaccuracies typically observed in self-reports (cf. Tourangeau, Rips, & Rasinski, 2000), the current study is based on momentary or "real-time" reports in the recreationists' natural environment. According to Stone, Shiffman and DeVries (1999), investigators will obtain more accurate observations if they take immediate self-reports in natural surroundings. This method is labeled Ecological Momentary Assessment. The approach is gradually being integrated into the tradition of leisure studies (e.g., Borrie, 1995; Graef, Csikszentmihalyi, & Gianinno, 1983; Hull, Michael, Walker, & Roggenbuck, 1996; McIntyre & Roggenbuch, 1998; Scherl, 1990; Stewart, 1992; Stewart & Hull, 1992; Stewart & Hull, 1996; Vogt & Stewart, 1998).

Anchored in either one or both of the dimensions of valence and arousal, a growing number of self-report scales have been developed. Many single-item measurement of affect exist (Larsen & Fredrickson, 1999). These instruments ask research participants how they are feeling on a single affect construct. A recent example is the single-item scale proposed by Fredrickson, Tugade, Waugh, and Larkin (2003) who used a modified single-item Affect Grid (Russell, Weiss, & Mendelsohn, 1989). Moreover, the recent Nobel laureate and the world's leading authority on hedonic psychology often utilizes single-item affect measure in his studies (e.g., Kahneman, 1999).

Although single-item instruments have high face validity, several researchers prefer to measure affect by means of multi-item inventories. A well-known example is the 20 item Positive Affect Negative Affect Schedule (Watson, Clark, & Tellegen, 1988), which has an extended 60 item version, the PANAS-X (Watson, 2000). Due to the scale's strong emphasis on the arousal dimension (the scale includes items such as active, alert, strong, jittery and upset) the PANAS has compellingly been criticized for not representing a valid measure of affect (Bagozzi, 1993; Derryberry & Reed, 1994; John, 1990; Kennedy-Moore, Greenberg, Newman, & Stone, 1992; Nemanick & Munz, 1994; Russell & Carroll, 1999). The constructors of the PANAS have recently suggested that what the scale actually measures should be relabeled Positive Activation and Negative Activation, respectively (Watson, Wiese, Vaidya, & Tellegen, 1999).

To remedy the low validity of the PANAS, a common strategy among affect researchers has been to sample high face validity items along the two dimensions. For example, the researcher simply asks respondents to indicate how frequently (or intensely) they experience affects such as joy, affection, fear or annoyance. This practice is widespread with a number of articles published in high quality periodicals (Barrett, 1998; Bless & Fiedler, 1995; Crooker & Near, 1998; Eid & Diener, 1999; Forgas, 1998a, 1998b, 1999; Ishii, Reyes, & Kitayama, 2003; Kitayama & Ishii, 2002; Larsen, McGraw, & Cacioppo, 2001; Larsen & Diener, 1992; Marco & Suls, 1993; Mesquita & Karasawa, 2002; Rodríguez & Church, 2003; Schimmack, 2001; Velting & Liebert, 1997; Winkielman, Knäuper, & Schwarz, 1998). For the current study we selected adjectives representing both the arousal dimension (such as *relaxing* and *strenuous*) and the valence dimension (such as *glad* and *annoyed*).

Asymmetrical Conflicts in Recreation

In this study we focused attention on the cross-country skier's experiences only because of the asymmetrical nature of the conflict between snowmobilers and cross-country skiers. It is primarily from the skier's perspective that the encounter is conceived as problematic. Such a one-way conflict between those who utilize motorized vehicles and those who prefer self-propelled forms of recreation has been reported regularly in the leisure literature for 40 years (Adelman, Heberlein, & Bonnecksen, 1982; Lime, 1975; Lucas, 1964; Watson, Williams, & Daigle, 1991). There is now a growing understanding that various forms of high-quality outdoor recreation are incompatible, and that increasing competition for outdoor resources on a limited public land base fuels conflict situations (Jackson, Haider, & Elliot, 2002). The one-way nature of recreational conflict has been demonstrated for canoeists and motorboaters (Adelman et al., 1982), oar-powered and motor-powered whitewater rafters (Shelby, 1980), water skiers and anglers (Gramann & Burdge, 1981), and hikers versus trail bikers (Watson et al., 1991).

The asymmetrical relation is also evident between cross-country skiers and snowmobilers. Part of the conflict is interpreted with reference to differences in the specific motivations for these groups. For example, Jackson and Wong (1982) found that cross-country skiers placed greater importance on the natural environment, including quiet and undisturbed nature, whereas snowmobilers placed greater importance on escapism and socialization factors. Earlier work identified fundamental differences in attitudes toward the environment (Knopp & Tyger, 1972). In particular these authors found that the ski-touring group was more environmentally friendly and perceived more need for recreational land management as compared with the snowmobile sample. Also, Knopp and Tyger reported that snowmobilers scored lower on socioeconomic indicators such as income and education than did cross-country skiers. Recently, however, a qualitative study conducted in Norway revealed that nature experience is an important motive for snowmobilers (Pedersen, 1999). The relevant point is that skiers and snowmobilers can have similar goals, within different subcultural frames. Their recreational means of reaching their goal are different, which sustains the asymmetrical nature of the conflict.

Priming

Research on automaticity and priming has convincingly illustrated how our immediate context has unintended consequences for subsequent thoughts, feelings and behavior (Bargh & Chartrand, 2000). Thus, the priming paradigm can be used to research the passive, unintended influence of the current and recent environmental context. Within environmental psychology, the most compelling evidence for the priming effect is probably offered by McNamara in his spatial priming of cognitive maps (e.g., McNamara, Ratcliff, & McKoon, 1984). The basic finding in this study is that the recognition time for an object in a spatial layout will be faster if the object is preceded by another object that is closer in terms of cognitive distance. The accessibility of information in memory is of critical importance to how a person evaluates objects and thus to the study of attitudes, beliefs, values and other aspects of human information processing (Bargh, Chaiken, Raymond, & Hymes, 1996). For example, students participating in an experiment conducted by Bargh and his colleagues were primed by means of a scrambled sentence test[1] to activate concepts of either rudeness or politeness. The students were then sent to their supervisor who was busy talking with someone else. Without the participants knowing it, they were observed as they waited for their supervisor's attention. Students primed with rude stimuli were far more likely to interrupt the ongoing conversation (63%) than were nonprimed participants. Those primed with politeness interrupted the least often of all (17%—see Bargh, Chen, & Burrows, 1996, Experiment 1).

Priming studies are concerned with the temporary activation states of an individual's mental representations and how these states of internal readiness interact with environmental information to provide perceptual evaluations and social behavior. This principle was utilized in the present study. We exposed a randomized sub-sample to a snowmobile encounter, and we explored the possible priming effects in the participants' beliefs regarding the consequences of motorized recreation. To illustrate, one could imagine that participants who have recently encountered a snowmobile will have activated ecologically relevant aspects of their representations of the vehicle, and of the consequences of the encounter. For participants lacking such a recent experience, representations will be more prone to cognitive biases in recalling a snowmobile scenario. A second goal for the current study was thus to discover a possible priming effect of a recent conflict situation on cross-country skiers' general beliefs about the impact of snowmobiling in recreational areas.

Purpose of the Study

The primary aim of this study was to document the importance of affective responses in recreational conflict. A randomized experimental design was used to reveal how cross-country skiers were emotionally affected if they met with a recreationist on a snowmobile. The first hypothesis was that the subjective experience of cross-country skiers would be negatively affected when the skiers encountered a snowmobile, as compared with skiers who were not exposed.

Through the experimental design, a second goal of the study was to look for priming effects subsequent to a recreational conflict. We assumed that the snowmobile encounter activated a more realistic representation of the situation in the experimental group compared with the control group. Hence, we hypothesized group differences in general beliefs regarding possible negative effects from the use of snowmobiles.

Method

Participants

The sample was composed of 87 cross-country skiers (47 females or 54%) above 18 years ($M = 40.5$, $SD = 11.8$) in Troms County in northern Norway. Study participants were randomly assigned to an experimental group ($n = 48$) who encountered a moving snowmobile just before responding to a questionnaire and a control group ($n = 39$) who did not encounter a snowmobile. Because most skiers entered the research area in small groups, we were unable to split the total sample into two exactly equal subsamples. Mean age for the experimental group was 40.8 years, for the control group 40.2 years. The mean age difference was not significant ($t = 0.25$, $p = .81$). Twenty-four females and 23 males were in the experimental group and 24 females and 16 males in the control. This difference was not significant (Pearson chi-square $= .69$, $p = .404$). Because of partial missing data, the number of respondents varied slightly across survey items.

Measures

Affect. Five items in the questionnaire requested information on the participant's affective experiences. The items were selected from both the valence and the arousal dimensions of affect. Respondents gave their ratings on a 5-point scale (5 = fits perfectly) for how well each of the following adjectives fit with the experience they had during the last five to ten minutes of their skiing activity: *relaxing*, *quiet and peaceful*, *annoying* (to be reversed), *joyful* and *filled with harmony*. The Cronbach's alpha for all five items was .82.

Beliefs about snowmobiles. Participants also rated their general beliefs about the effects of snowmobiling. The questions asked were, following the instruction: "During your trip today, if you were disturbed by a snowmobile [participants in the control situation were asked to imagine an encounter with a snowmobile], was it because: *It is illegal to use snowmobiles*, *Snowmobiles make a lot of noise*, *Snowmobiles destroy ski tracks*, *Snowmobiles disturb the aesthetic dimension of a ski outing*, *Snowmobiles disturb wildlife*. Answers were given on 5-point Likert-type scales (1 = No, that doesn't matter, 5 = Yes, that is an important reason why I was disturbed).

Procedure

To reach the participants in an ecologically valid situation, a camp with one tent was established in the Snarbyeide area, which is a popular recreation site in the municipality of Tromsø. As with most areas in northern Norway (and all areas in southern Norway), recreational snowmobile use is forbidden in this location and only exceptionally do encounters with snowmobiles occur. Local management authorities and police were informed in advance. The camp was located about half an hour walking distance from the parking lot. Four research assistants were instructed to approach all skiers coming from the trailhead. Skiers were asked to participate anonymously in a research project on affective experiences in the outdoors. They were told the project was being conducted by the University of Tromsø. They were then handed a two-page questionnaire and a pencil and left by themselves to answer the questions. During the two days of data collection only nine skiers refused to answer the questions. One of them refused because he was so angry at the snowmobile he had just met. Most of the others were using dogs and found it inconvenient to take a five-minute break and deal with the questionnaire and eagerly pulling dogs at the same time. After completing the questionnaire, participants were offered something hot to drink and some crackers to eat. Data were collected on Saturday, March 17, and Sunday, March 18, 2001.

Five to ten minutes before the skiers entered the camp, a random sub-sample (n = 46) of them met with a snowmobile. The snowmobile was operated by one of us, but the link between the snowmobile and the research camp was not revealed to the participants. The snowmobile passed the skiers carefully and at due distance from the ski trail, which, depending on the terrain was approximately 5 to 10 meters away.

On the first page of the questionnaire we asked the participants to respond to questions about their reasons for skiing on this day, about their experience of nature, and about how experienced they considered were as cross-country skiers. Nothing was mentioned about the snowmobile. On the second page of the survey, skiers indicated whether they had met a snowmobile or not and then filled out the belief items. At the bottom of the second page we asked for background information.

Analysis

Data were entered into SPSS 10.0 for Windows. Descriptive statistics were used to describe the dependent variables. Ordinary t-tests were used to determine whether there were significant differences between the experimental and control participants in terms of the dependent measures. Effect sizes (d) were calculated by hand, according to the equation $d = (Me - Mc)/Ms$. (Me = mean experimental group, Mc = mean control group and Ms = mean standard deviation for the two groups). Due to a non-normal distribution in one of our dependent variables, we also utilized the Mann-Whitney test statistic for one of our analyses. For the same reason we used a Structural Equation Modeling approach

with robust maximum likelihood estimation (Satorra & Bentler, 1994). This analysis was conducted with EQS 5.7b for Windows (Bentler, 1995). Goodness-of-fit for the model was evaluated by means of (a) a chi-square (χ^2) statistic (the difference between a theoretical model and actual data can be measured by a Maximum Likelihood discrepancy function shown to follow a central chi-square distribution—Bollen, 1989); (b) a Comparative Fit Index (CFI), that compared the theoretical model with a target model on the assumption that all the observed variables were uncorrelated (Hu & Bentler, 1995) and (c) the Root Mean Square Error of Approximation (RMSEA). Error of approximation is the error due to model misspecification. To avoid overparameterization of a model, the RMSEA is preferable because it measured the discrepancy per degree of freedom (Steiger & Lind, 1980). Good fit between the hypothesized model and the observed data is indicated by a nonsignificant χ^2, a CFI above .95, and a RMSEA below .06 (Hu & Bentler, 1999).

Results

Affective Responses

Table 1 describes the raw-score variables for the affect items. Means and standard deviations lie within the expected range (the latter are recommended to be no larger than one-fifth of the range; e.g., Howell, 1992). Most of the items deviate somewhat from a normal distribution with the item annoyed showing the most severe degree of skew.

Our first hypothesis that cross-country skiers who met a snowmobile would have the quality of their affective experiences degraded was confirmed by a t-test. The feelings reported by skiers meeting a snowmobile were significantly less positive than those of skiers who did not meet a snowmobile ($M = 4.2$ vs. 4.6, $t = -2.82$, $p < .01$). Effect size (delta) .63, indicated that the groups differ by .63 standard deviations. By consensus, delta values between .5 and .8 are considered to represent a medium effect size (Cohen, 1992).

The t-test presupposes the dependent variable to be normally distributed, but this assumption was violated in our data. Although the t-test is known to handle non-normality reasonably well (e.g., Howell, 1992), we did three additional analyses to be sure that our result was not due to a distributional artifact. First, a new t-test was conducted with a nonlinear transformation (by means of squaring the original variable) of the positive affect variable (see Hartwig & Dearing, 1979). The transformed affect variable had a skew of -0.74, and the group difference on this variable was significant ($t = -3.03$, $p < .01$). Second, the non-parametric Mann-Whitney test was conducted because it does not assume normally distributed variables. The descriptive information from the test showed that participants in the experimental group rated their affective experience at a lower level (median = 4.2)

TABLE 1 Sample Size, Means, Standard Deviations and Skewness for the Affect Variables

	n	M	SD	Skew.
Relaxing	86	4.3	.9	−1.3
Quiet and peaceful	87	4.2	1.0	−1.1
Annoyed*	87	4.6	.86	−2.7
Joyful	87	4.3	.84	−1.1
Filled with harmony	87	4.3	.87	−1.4
Total affect scale	86	4.4	.67	−1.8

Note. SD = Standard Deviation; Skew. = Skewness; * = Reversed item.

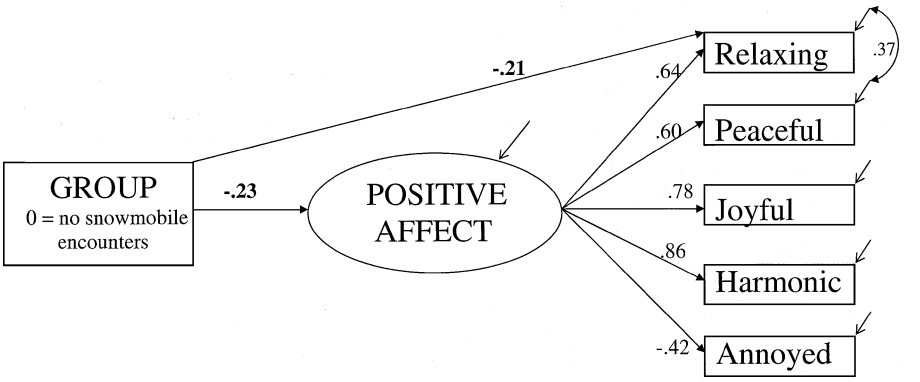

FIGURE 1 A full Structural Equation Model of positive affect regressed on the group membership variable. All structural weights shown in the figure are significant at $p < .05$.

than participants in the control group (median = 4.8). The Mann-Whitney U was 566.5 ($z = -3.1$), with an associated significance of $p < .01$.

Our third analysis of the relationship between the experimental condition and self-rated affects was a Structural Equation Modeling approach (e.g. Bollen, 1989; Kline, 1998). Our model is depicted in Figure 1. The data fit the model excellently when the Satorra-Bentler robust statistic (Satorra & Bentler, 1994) was used: χ^2 (11, n = 86) = 5.2*, p = .92, CFI = 1.00*, RMSEA = .00. By convention, the asterix indicates parameters estimated with the Satorra-Bentler equation. Since the chi-square test is sensitive to sample size, the non-significant result of our test is not impressive (a low n easily ends up with non-significant results). The fit indices, on the other hand, are less sensitive to the sample size, and since the CFI estimate is excellent in the present case, we find it appropriate to conclude that our model is consistent with the data. For example, if the data from our investigation, hypothetically, were generated by a sample of 1000 subjects, instead of the actual 86, the χ^2-value would have been 68.7 and significant. The CFI on the other hand would still be an impressive .97. In the model, the relationship between affective quality and manipulation was significant (the standardized regression coefficient (β) was -. 23, $p^* < .05$). Moreover, the figure shows that an additional relation exists between the dependent and independent variables, namely a direct path from the group variable to the relaxing item ($\beta = -.21$, $p < .05$). This path indicates that meeting a snowmobile has an effect on the feeling of relaxation over and above what this item contributes to the positive affect factor. In the model, the error terms related to the relaxing and the peaceful experiences are correlated, which indicates that these feelings have something in common that is not shared by the remaining affect variables.

General Beliefs

Descriptive statistics for the five belief items (Table 2) reveal that disturbing noise is considered to be the most damaging among the five effects of snowmobile use (M = 4.4). A means comparison between the two study conditions shows that the noise variable is the only variable manifesting a significant difference between skiers who did meet a snowmobile versus skiers who did not (M = 4.6 vs. 4.1, t = 2.37, $p < .05$). The effect size was d = .52. There was a tendency for the experimental group to be more negative towards snowmobiles in general, but beliefs about noise provided the only comparison that reached significance (Table 3).

TABLE 2 Sample Size, Means, Standard Deviations and Skewness for the General Belief Variables

Belief item	n	M	SD	Skew.
Snowmobiles are illegal	80	3.2	1.5	−0.1
Snowmobiles make noise	83	4.4	1.0	−1.4
Snowmobiles destroy ski-tracks	82	3.2	1.4	−0.2
Snowmobiles destroy landscape aesthetics	83	4.0	1.2	−1.0
Snowmobiles disturb the wildlife	83	3.7	1.4	−0.5

Note. M = Mean; SD = Standard Deviation; Skew. = Skewness. Scale range = 1–5 (5 = important reason why snowmobiles are disturbing).

Discussion

This study reported our investigation into the hypotheses that meeting a snowmobile would reduce the affective quality of a recreational event for cross-country skiers, and would influence general beliefs about snowmobiles. The first hypothesis was confirmed when participants in the experimental group reported more negative affects during their recreational event compared with the control participants. The second hypothesis was partly supported. Skiers encountering a snowmobile indicated that they found noise from snowmobiles more disturbing than did skiers in the no-encounter condition. However, no significant group differences were found in beliefs about damaging effects on landscape aesthetics, ski tracks or wildlife.

A special feature of this investigation is its experimental approach. Although several important avenues exist for scientific progress, a privileged position is held by the randomized experiment. By moving from the laboratory into actual recreational areas, we also have addressed the important issue of ecological validity. Participants were studied in the environment they typically inhabit and use for their leisure activities. Measuring subjective feelings on the actual site provides insights into recreational experiences not available to studies conducted in the laboratory.

Models of recreation conflict have basically focused on attribution- and norm-related indicators of conflict and to a lesser extent on the subjective responses generated by the conflict. In this study we argued that affective responses are indeed an issue in recreational conflict. Results from our experiment support our claims with solid empirical evidence. This should not come as a surprise. Affects constitute an imperative part of people's everyday

TABLE 3 Means and t-Values for the General Belief Variables for Groups Encountering vs. Not Encountering a Snowmobile

Belief items	Did encounter a snowmobile	Did not encounter a snowmobile	t
Snowmobiles are illegal	3.2	3.2	−0.12
Snowmobiles make noise	4.6	4.1	2.37*
Snowmobiles destroy ski-tracks	3.3	3.1	0.73
Snowmobiles destroy landscape aesthetics	4.1	3.8	1.14
Snowmobiles disturb the wildlife	3.8	3.6	0.62

Note. n = 45 in the encounter condition and 36 in the control group. * = $p < .05$. on both the t-test and the Mann-Whitney test statistics. Scale range = 1–5 (5 = important reason why snowmobiles are disturbing).

life, including leisure. In the case of recreational conflict, subjective feeling states seem particularly salient. Following widespread ideas in recent social psychology, negative affect is the result of goal obstructions. For example, according to appraisal theories (e.g., Smith & Ellsworth, 1985) the mental response to unwanted situations that occur, or wanted situations that do not occur, is a negative emotion. Given the salient role of goal interference in established conflict models (e.g., Jacob & Schreyer, 1980) one would expect affective responses to follow. Hence, the issue of subjective feelings should be an explicit part of a comprehensive theory of recreational conflict. Currently, we do not have such a fully developed model to offer, and we readily admit that much theoretical and empirical work remains to be done to fulfill such a task. Our contribution in the current work is restricted to documenting, by means of scientific experimentation, the diminished subjective experience on the part of the weaker actor in the asymmetrical conflict arising from encounters between motorized and non-motorized recreationists.

Compared with earlier work on recreation conflict, our study in some respects approaches that of Ingrid Schneider (Schneider, 2000; Schneider & Hammitt, 1995). Although Schneider's model emphasizes the stressfulness of recreation conflict, it explicitly relies on the theories of Richard Lazarus (e.g., Lazarus & Folkman, 1984). Recently, Lazarus has started encouraging scholars to focus attention on emotion rather than on stress: "Stress is a part of a much broader and richer rubric, emotions. Although I have made a reputation in the field of stress, and at the risk of undermining an extended personal investment, I propose that we would be wiser to move away from stress toward the measurement of emotion" (Lazarus, 1990, p. 12). Following the recommendations in current stress research, our contribution complements the recent recreation literature moving toward a more emotion-focused approach to comprehending recreation conflict (Iwasaki & Schneider, 2003; Miller & McCool, 2003; Schuster, Hammitt, & Moore, 2003). For instance, in a study of recreationists in a USA national park located, a pattern of affective responses was observed in association with different levels of stress (Miller & McCool, 2003).

Considering the results revealed in our study, it might seem rather obvious that cross-country skiers have the quality of their affective experience of nature lowered when they encounter snowmobiles. Recall, however, that in the present study the data were reports of skiers' *general* subjective experiences during a period of their trip in which for a brief period a single snowmobile passed by carefully and at a considerate distance. Even if the result was predictable, expectations and anecdotes about the negative effects of snowmobile use are unsatisfactory as scientific documentation or for the formulation of public policy. In the context of how outdoor recreation worldwide is rapidly changing, solid documentation of psychological as well as social and biological effects of snowmobile use is badly needed to guide natural resource management.

Another interesting (and again, non-obvious) result was the finding that the experimental group revealed more negative beliefs about snowmobiles in general and about snowmobile noise in particular. In this connection, noise has repeatedly turned out to be among the most negative consequences of snowmobile use. For example, in an earlier questionnaire-based investigation we found noise to be the most salient self-reported effect of snowmobile use on other recreationists in northern Norway (Vittersø, Chipeniuk, Skår, & Vistad, 2003). Stressful consequences of noise on recreation were also reported for Canada (Kariel, 1990), the USA (McDonald, 1990), and Australia (Dellora, Martin, & Saunders, 1984 cited in Mace, Bell, & Loomis, 1999).

One of the primary reasons for outdoor recreation is to escape the noise found in urban areas (Driver, Nash, & Haas, 1987; Greider, 1993; Kariel, 1980; Mace et al., 1999; McDonald, 1990; Ruddell & Graman, 1994; Tarrant, Haas, & Manfredo, 1995; Uyeno, Hamilton, & Biggs, 1993; Wahlberg, 1989). As Kaplan (1995) pointed out, natural

environments are often a destination for people in need of restoration, and to serve that purpose they must include the attributes of tranquility, peace and natural quiet. Noise is also a potential threat to human health and well-being. For instance, Cessford (1999) found that visitors to popular New Zealand walking tracks demonstrated a varied range of tolerance for noise effects in the different examples assessed, but they highlighted particular noise issues related to sightseeing flights, recreational motorboating, and social noise in huts. For these reasons silence is a highly valuable, though fragile resource, and symmetrical recreational conflicts like the one investigated in our study may have serious implications over and above the reduced affective experience at the recreational site.

The difference in general beliefs about snowmobiling implies that people may underestimate the negative effects of snowmobile noise in the context of an ordinary survey. As shown in our data, individuals who have a recent and naturalistic representation of snowmobile noise evaluate it as more disturbing than do individuals who lack such a primed representation. This result has at least two important and general consequences. First, and consistent with a series of recently published results in the social psychological literature (see Bargh & Ferguson, 2000, for an overview), this finding demonstrates how unconscious priming may affect one's evaluations, beliefs and attitudes. Accessibility of knowledge is known to be a function of how recently it has been used (Higgins & Bargh, 1987). Our study shows how the representation of relevant information increases the negativity of skiers' general beliefs about noise from a snowmobile. Second, in the interest of collecting reliable leisure data, ecologically valid investigations need to be conducted in the domain of recreation research. Otherwise, as we have shown, biases seem to operate in such a way as to impart an artificially reduced negativity to recreationists' reports of their beliefs about the harms done by snowmobiles.

Limitations

What our study did not provide is knowledge about long-term consequences of the negative effects of motorized recreation. For example, do people habituate to the increasing use of motorization in natural settings? That question must await the outcome of future investigations. The answer is not easily anticipated. Previous studies have shown that people do not readily habituate to noise (Diener, Suh, Lucas, & Smith, 1999; Frederick & Loewenstein, 1999; Knopf, 1987). Rigorous longitudinal studies are needed before we can generalize about the long-term ramifications of recreational conflicts of the kind discussed in this article.

Another limitation of our study is the local context within which the experiment took place. Although snowmobiles are encountered commonly in the study area, use of snowmobiles is quite strictly regulated in Norway through the 1977 Act relating to motor traffic on uncultivated land and in watercourses. The general rule is that recreational use of ATVs (all-terrain vehicles) and snowmobiles is prohibited, but several utilitarian uses are accepted. For example, the Sámi people use both ATVs and snowmobiles in their reindeer herding. A legal exception also exists for motorized transportation in connection with certain kinds of subsistence-like but leisure-related activities such as fishing, hunting and berry picking, especially in the three northern counties (in one of which our study was conducted). Snowmobiles may also be employed in research, and our use of the snowmobile was thus fully legal. Nevertheless, some skiers participating in the study may have believed operation of the study snowmobile was outside the law. If they did, it could add a confounding element to the results. To remedy this situation, we ran an ordinary ANOVA with affect as dependent variable and group membership as independent variable and the general belief item "snowmobiling is illegal" as a covariant. Even when beliefs concerning the illegality of snowmobiling were partialled out, the affect quality was reduced

significantly for the experimental group. This result strengthens our assumption about the general consequences of snowmobile encounters, although it does not completely eliminate the issue. As with many studies in the social sciences, a replication of the current study is warranted.

In summary, this article presented the results of an experiment demonstrating certain effects of snowmobiling on cross-country skiers. Emotional quality was significantly reduced for cross-country skiers who encountered a single snowmobile being driven carefully alongside the ski track. To some extent such encounters altered even general beliefs about snowmobiling, relative to the attitudes of a control group. Given the growing curiosity about emotions and affects now manifesting itself in the recreation literature (e.g., Iwasaki & Schneider, 2003), we hope the results will stimulate further interest in the important links between recreational conflict, stress and affective reactions.

Note

1. In a scrambled sentence test, participants are presented with a line of words in randomized order. They are instructed to make coherent, grammatical sentences out of each string of words. In the course of doing so, they are exposed to some words that are related to the concept the experimenter wishes to prime. Participants are told that the task is designed to measure their language ability and are thus blind to the real purpose of the task.

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