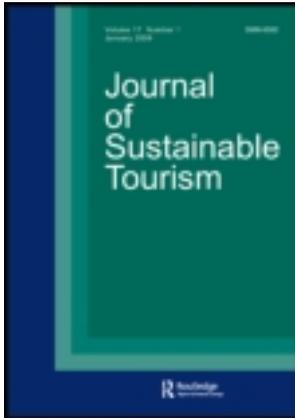


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Understanding environmentally significant behavior among whitewater rafting and trekking guides in the Garhwal Himalaya, India

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Garhwal, Uttarakhand, India, is planning for large-scale sustainable mountain tourism. However, current tourism practices have resulted in waste accumulation and vegetation loss. This paper explores the possibility of increasing the role of whitewater rafting and adventure tour guides to reduce tourists' environmental impacts. Earlier studies on guides acquiescent with this role have found it to be effective in altering client behavior and minimizing environmentally destructive behavior. However, only limited research focuses on guides from developing countries outside an ecotourism context. This exploratory research in Garhwal, India, helps explain adventure guide intentions to perform pro-environmental behavior. The theory of planned behavior was applied to identify factors leading to a sample of 68 whitewater and trekking guides to perform three environmentally significant behaviors – packing out rubbish, burying their human waste and cutting living trees for firewood. Results suggest that the theoretical antecedents of the theory of planned behavior can predict intentions to perform pro-environmental behavior among non-western guides. Possible impediments to consistent performance of pro-environmental behavior among guides were noted, including lack of social pressure to change, abhorrence of contact with excreta, caste issues, effort expended to dig burial holes, etc. Managerial possibilities to encourage change are discussed.

Keywords: adventure tourism; guide; Himalaya; India; theory of planned behavior; tourism impacts

Introduction

Although research has extensively covered the impact of tourism on natural landscapes (Gössling, 2000), the inclusion of a tourism perspective on sustainable mountain development has shaped new policy-focused research (Nepal & Chipeniuk, 2005), particularly in developing regions. Borne out of this perspective, sustainable mountain tourism has emerged in an attempt to diversify local economies, promote peace, increase employment and improve infrastructure, among other ambitions (Gössling, 2000; Lama & Sattar, 2004). It also serves to reduce any negative impacts of tourism operations upon the natural landscape through local-level planning and management (Lama & Sattar, 2004). At this scale, it is thought that underrepresented and marginalized people in developing mountain regions will be able to establish a voice and a role in the development of their communities. Terms

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such as *participatory* and *community-based* underscore conclusions of who should be seated at the planning table. Such conclusions help in shifting perspective from a top-down to a bottom-up tourism development approach. Still, research on these stakeholders who could be most influential in the reduction of negative environmental impacts in developing countries remains relatively cursory. Examining the reasons why guides, who are critical in fostering sustainable mountain tourism, engage in behavior that causes environmental change (i.e. environmentally significant behavior [Stern, 2000]) may help depose speculative assumptions of behavior and roles to better understand how tourism impacts upon the landscape can be minimized. In this study, we specifically examine pro-environmental behavior.

The significance and roles of nature tour guides

The capacity for guides to help implement sustainable tourism practices has led to a host of expectations. Since Cohen (1985) first analyzed the historic and modern role of the tour guide and proposed a *pathfinder* and *mentor* role, guides have been the focus of these and additional expectations and roles. For instance, Weiler and Davis (1993) modified Cohen's model by adding *motivator* and *environmental interpreter* to the original model. This expansion added several new implicit roles for nature tour guides revolving around the concept of sustainability. Included were advocate for, and role model of, sustainable behavior and monitor of impacts based on traditional ecotourism principles (Huang & Weiler, 2010). Guides acquiescent with these roles have been found to be effective in altering client behavior and minimizing environmentally destructive behavior. Various authors have shown the potential a guide has to ease tourism impacts by influencing client behavior in eco and adventure settings, especially when linked with training in minimal impact skills (Barker & Roberts, 2004; Littlefair & Buckley, 2008; Randall & Rollins, 2009; Roggenbuck, Williams, & Bobinski, 1992; Wagstaff & Wilson, 1988). However, much of the literature tends to focus on eco-guides. Consequently, though these roles are clear and reasonable for the eco-guide, we argue they are assumed and ambiguous when applied to the adventure guide.

If a guide chooses to partake in ecotourism, the role of the guide is clear thanks to the many definitions and principles that outline job descriptions for guides (e.g. Goodwin, 1996). These definitions direct eco-guides to be role models of pro-environmental and culturally sensitive behavior and assist in natural resource management (Black, Ham, & Weiler, 2001; Muñoz, 1995). Several studies focus on ecotourism and the natural resource management role of guides within this context (Black et al., 2001; Haig & McIntyre, 2002; Ormsby & Mannle, 2006; Peake, Innes, & Dyer, 2009). The principles of ecotourism allow for this role to be augmented by training, certification, licensing and standards (Huang & Weiler, 2010). Yet, there is a dearth of research on defining such a role for guides in a context outside of ethics-based ecotourism. This is particularly true for adventure guides who (1) operate under theoretically different client expectations (Weber, 2001), (2) live and guide in a socially unique developing country and (3) guide an understudied domestic clientele, as is the case in Garhwal, Uttarakhand, India. For instance, if a whitewater rafting guide in Garhwal does or does not feel and act like a model eco-guide (Huang & Weiler, 2010), can we attribute some degree of tourism impact (positive or negative) to factors that drive the intention to perform environmentally significant behaviors?

The term *guide* in this study refers to adventure tour guides, the focus of this study. Rather than assume the role adventure tour guides should have to mitigate tourism impacts in Garhwal, it was believed necessary to first understand why guides performed

environmentally significant behaviors and then to assess their potential resource management role second. We first asked: what are those factors that lead whitewater and trekking guides to perform environmentally significant behavior? A central aim of this research was to assess the efficacy of a theory-based approach to addressing the above question and gain a basic understanding of guide behavior in the Garhwal region of India. The theory of planned behavior (TPB) provided a useful model in this initial step toward understanding human behavior (Ajzen, 1991).

Cognitive and affective responses: performing pro-environmental behavior in Garhwal

Cognitive and affective responses both affect attitude. In the behavioral domain, cognitive responses consist of knowledge and perceptions about the behavior in question (Ajzen, 1989). Affective responses are composed of values, feelings and emotions about the behavior (Ajzen, 1989). The study of each of the two responses and their domains is essential to understanding the extent to which guides might carry out pro-environmental behavior and embrace a recreation resource management role. Iozzi (1989) examined the role of the affective domain in environmental education and reported that the cognitive and affective domains were linked. Iozzi found that components of the affective domain were as important, and possibly more so, than knowledge of and how to perform pro-environmental behavior. Iozzi (1989) added that to examine these domains separately could pose threats to research validity.

Similar to recycling, acts of pro-environmental behavior in the outdoors are carried out with intentions to benefit future users (Smith, Haugtvedt, & Petty, 1994). These behaviors may be seen as altruistic, where guides expend personal resources and achieve little immediate benefit (Smith et al., 1994). Therefore, guides may indeed be influenced not only by cognitive processing of these behaviors and their impacts, but also by components of the affective domain unique to a guide's environment when it comes to actual performance of pro-environmental behavior. The extent that we could study both domains was, however, limited by our resources. We primarily focused on the cognitive aspects of pro-environmental behavior and included an elicitation study of salient beliefs to direct future research on the affective domain.

Theoretical framework

There are various theoretical frameworks that can be used to confront environmental issues (Bonnes, Lee, & Bonaiuto, 2003). Our exploratory research on guide behavior employed the theoretical antecedents of the theory of planned behavior (TPB; Figure 1). The TPB was designed to determine the intention to perform a behavior and draws upon conceptually independent predictors that are assumed to be influential and able to capture the motivational factors that influence a behavior (Ajzen, 1991; Ajzen & Driver, 1992). The theory accomplishes this by measuring the following constructs: attitudes toward a behavior (attitude), social influences of performing the behavior in question (subjective norm) and perceived control over performance of the behavior (perceived behavioral control [PBC]). The theory has been useful to help understand and predict environmentally related behavior, or, at the very least, serve as a good starting point to gain understanding. Sample areas of research include conservation behavior (Beedell & Rehman, 2000; Harland, Staats, & Wilke, 1999), green consumerism (Bissonnette & Contento, 2001), environmental activism

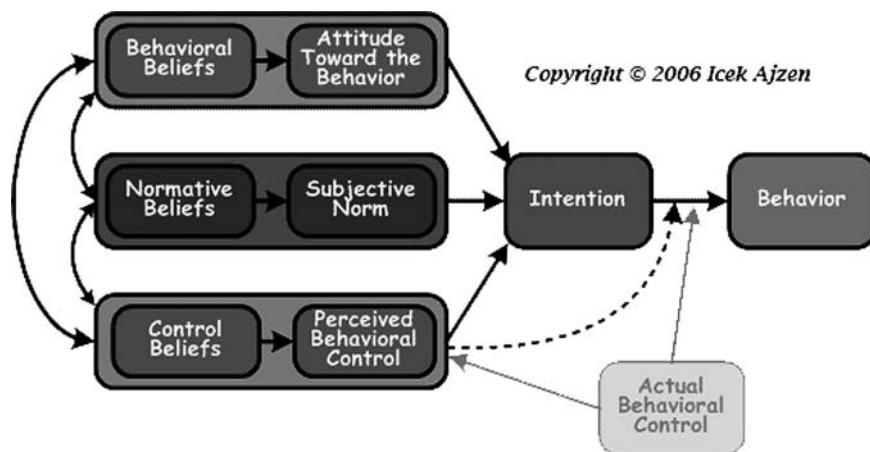


Figure 1. The theory of planned behavior (Ajzen, 2006). This image was reproduced with the permission of Icek Ajzen.

(Fielding, McDonald, & Louis, 2008), rural/urban studies (Hinds & Sparks, 2008), reforestation (Karppinen, 2005), recycling (Knussen, Yule, MacKenzie, & Wells, 2004; Tonglet, Phillips, & Bates, 2004) and construction waste management (Teo & Loosemore, 2001).

Cultural specificity, a vital component of this study, was found to be an important ingredient to the TPB given that different populations may have different beliefs regarding the same behavior (Cheung, Chan, & Wong, 1999), which the TPB does address. However, Lee, Ebesu-Hubbard, Kulp-O'Riordan, and Kim (2006) found that few studies had been conducted to support the validity of the TPB within non-western cultures. Oreg and Katz-Gerro (2006) stated that cultural conditions in conjunction with the TPB were instrumental in shaping individual's actions toward environmental issues. Consequently, we believe that the TPB was a good fit for exploratory research with an opportunity to examine the applicability of the theory in an international setting and the adventure tourism context.

The TPB has been criticized in the domain of pro-environmental behavior. Research continues to examine these issues. One limitation argued by Bonnes et al. (2003) is that the TPB does not address the *social dilemma* where the interests of the collective and the individual are opposed (Dawes, 1980). In our study, this scenario occurs where the collective may be affected by the outcome of the individual's behavioral achievement. The TPB does not record the factors that are assumed to determine the outcome: an individual's perceived usefulness and fairness of behavioral achievement (Bonnes et al., 2003). A second limitation potentially affecting our study is that the theory does not directly account for the affective domain (Martin & McCurdy, 2009). Moral and personal norms, or self-expectations, are reflections of one's values and have been found to improve the effectiveness of the TPB (Harland et al., 1999; Kaiser, 2006; Stern, Dietz, & Black, 1986). Other limitations of the theory include the inability to determine the influence of groups and identity on norms (Bonnes et al., 2003; Fielding et al., 2008), the irrelevancy of past behavior and perceived habit (Bonnes et al., 2003; Cheung et al., 1999; Knussen et al., 2004; Rossi & Armstrong, 1999) and the argument that PBC may not always predict actual behavioral control due to the pervasiveness of self-reported rational thoughts (Harland et al., 1999; Sharma & Kanekar, 2007).

The theory does postulate, however, that behavior is a function of beliefs. Beliefs provide the cognitive and affective fundamentals to the behavior in question and help researchers strengthen the capability of predicting actual performance of behavior (Brown, Ham, & Hughes, 2010). The prediction of actual behavior was not the focus of this study. The collection of salient beliefs (typically completed as part of a pilot study [Ajzen, 2006]), though important, was not deemed critical to our research. After we determined that carrying out both a pilot study and an exploratory survey was not feasible given our resource constraints, an elicitation of salient beliefs was added to our questionnaire to aid a later, more extensive study.

Methods

Study area

The State of Uttarakhand, formerly Uttaranchal, with a population of just under five million (Government of India, 2001), is revered for its cultural affluence and scenic wonder and has been cited as having much potential for sustainable tourism growth (Mittal, Tripathi, & Sethi, 2008). Nature tourism, which includes eco, adventure and religious tourism, has been targeted as one type of sustainable tourism that could flourish within the State (Mittal et al., 2008) and has been growing steadily within the State for decades (Bisht, 1994; Government of India, 2001). The bulk of Uttarakhand's tourists in 2006 was an understudied domestic (Indian) tourism population of 19.5 million. Meanwhile, the State seeks to continue infrastructure development to attract more foreign tourists (Mittal et al., 2008).

A stronghold of Hinduism, Garhwal, one of two administrative units in Uttarakhand, covers a mountainous area of approximately 48,225 square kilometers. Garhwal is preparing for more religious and adventure tourism (Mittal et al., 2008; Rao & Nandy, 2001). In the past, however, increased tourism, including pilgrimages, in this region, has resulted in significant environmental impacts. Prevalence of waste disposal and vegetation loss in the Garhwal Himalaya were frequently discussed in the literature (e.g. Bisht, 1994; Farooquee, Budal, & Maikhuri, 2008; Kuniyal, 2002, 2005; Mahapatra, Vasistha, & Pandey, 2011; Nigam, 2002; Rai & Sundriyal, 1997; Silori, 2004; Singh, Suraj, & Kala, 2009) and are focal points in our study. Early tourism impacts in Garhwal were outlined by Bisht (1994) and Silori (2004). They detailed heavy deforestation and garbage dumping in Garhwal as two of the many significant impacts of unchecked tourism and use of the natural landscape. Kuniyal (2002, 2005) conducted research on the vast accumulation of organic and inorganic waste by mountaineers, pilgrims, religious tourists and trekkers in both Garhwal and Kumaon districts of Uttarakhand. More recent studies have explored waste accumulation in Garhwal's Bhyundar Valley (Singh et al., 2009) and perceptible impacts associated with whitewater rafting trips (Farooquee et al., 2008). The research has primarily described and quantified significant impacts associated with nature tourism in Garhwal, but has yet to sufficiently detail the influence of guides to mitigate tourism impacts in the region.

Sampling and data collection

Data were collected in Garhwal over a five-week span from late May through the end of June 2009. Intention, attitude, social norms and PBC regarding the performance of three visitor behaviors that are environmentally significant, i.e. (1) packing out trash (to collect throughout the trip and carry out of the jungle), (2) burying human waste (during the trip)

and (3) cutting living trees for firewood (worded in the negative to eliminate response bias), and past behavior were assessed. The questionnaire was translated from English to Hindi, examined for clarity by a fluent speaker of Hindi and English, reviewed by several guides and then administered. A delay in the translation occurred. Consequently, a number of questionnaires were completed by guides who felt capable of answering in English. Sampling of adult (India's minimum legal working age is 16) whitewater and trekking guides employed in Garhwal was conducted in two stages. The first stage incorporated convenient sampling to obtain a sample that was representative of the Garhwal whitewater and trekking guide population. Questionnaires were administered to 68 guides (crude population estimate is 300+) by visiting adventure tour companies, guide agencies and storefronts in Joshimath, Rishikesh and Uttarkashi, in Uttarakhand, and asking guides present at these locations to participate in the study. The second stage incorporated snowball sampling if sample numbers achieved during stage one were projected to be low for the day ($n < 3$). Using the social networks of local guide association representatives, adventure company owners and local guides, subjects were contacted and arrangements were made to have them complete the questionnaire. Participants were given the option of completing the questionnaire on-site or returning a completed questionnaire at a predetermined drop location. Research assistants provided translation and clarification services to the participants as needed.

Participants

Sixty-eight questionnaires were collected. The majority of those surveyed were employed as whitewater rafting guides (36.8%), followed by trekking guides (29.4%) and those who were both whitewater and trekking guides (26.5%). Gender was overwhelmingly male (98%). The average age of respondents was 29, spanning a range of 16–49 years of age, with 44% falling between the ages of 24 and 35 years of age. The sample averaged eight years of guiding experience.

Survey instrument

A questionnaire was constructed following Ajzen's TPB model (2006) containing 25 questions measuring four predictor variables of behavioral intention (attitudes, subjective norms, PBC and past behavior) and the dependent variable behavioral intention for three specific behaviors. A copy of the questionnaire can be found as an appendix to the online version of this paper. To measure these variables, participants were asked to respond to questions concerning packing out their trash, burying their human waste and cutting living trees for firewood. The response format was a 5-point semantic differential scale using various adjective pairs. To prevent response bias, questions for certain constructs were worded in reverse. To address past behavior, respondents were provided with four answers to gauge the frequency of occurrence of the target behavior in the month prior to the study. Gender, occupation, age and years of guiding experience were also collected.

Participants were asked to measure behavioral intentions and respond to the following: (1) I plan to (perform the targeted behavior) during the expeditions that I work and (2) I will try to (perform the targeted behavior) during the expeditions that I work. The response format was *strongly disagree* (1) to *strongly agree* (5) and *definitely no* (1) to *definitely yes* (5), respectively. We note that the same question was inadvertently used to measure intention to pack out trash ("I plan"). It is desirable, and was our intent, to measure intention with separate questions to achieve internal consistency ("I plan" and "I will" [Ajzen, 2006]). We

do not feel this is overly problematic as Harland et al. (1999) also used a single construct to measure intention to perform behavior without reportable consequences.

To measure attitudes, participants were asked to respond to the following: (performing the targeted behavior) during the expeditions that I work is (insert response). The response format was (1) *extremely bad* to (5) *extremely good*; (1) *extremely foolish* to *extremely wise* (5); and (1) *extremely unlikely* to (5) *extremely likely*.

Participants measured subjective norms and responded to the following: (1) People who are important to me think I should (perform the targeted behavior) during the expeditions that I work. (2) The people in my life whose opinion I value would (insert response) of me (performing the targeted behavior) during the expeditions that I work. The response format was *strongly disagree* (1) to *strongly agree* (5) and *disapprove* (1) to *approve* (5), respectively.

PBC was measured by asking participants to respond to the following: (1) How much control do you have over (performing the targeted behavior) during the expeditions that you work? (2) For me to (perform the targeted behavior) during the expeditions that I work is (insert response). The response format was *very little control* (1) to *complete control* (5) and *difficult* to *easy* (5), respectively.

Respondents were asked to address past behavior: In the last month, how often have you (performed the target behavior) during the expeditions that you have worked? Four answers were provided and ranged from *never* to *always*. This measure gauged the frequency of occurrence of the target behavior in the month prior to the study.

Data analysis

Questions pertaining to tree cutting and past history of packing out trash and burying human waste were first translated from Hindi to English, where necessary, and reverse coded in SPSS version 17 so that higher scores would demonstrate more favorable views toward pro-environmental behavior. Multiple imputation (MI) using the Markov Chain Monte Carlo (MCMC) method in SAS version 9.1.3 was chosen to represent missing-data uncertainty (Schafer & Olsen, 1998; Scheffer, 2002) as SPSS did not have MI capability. Prior to and after replacing missing values, skewness, kurtosis, and scatter and P-P plots were examined to determine if non-linearity, normality and heteroscedasticity of the dependent and independent variables met normality assumptions necessary for multiple regression. Reflected inverse data transformations were used to restore skewness and within acceptable, but not necessarily ideal, values of ± 1 for most constructs and ± 2 (Hutcheson & Sofroniou, 1999) for intention to pack out trash. Inter-correlations among variables were calculated and an assessment of collinearity was performed. The latter showed that all predictor variables fell within the acceptable coefficients of tolerance (0.1) and variance inflation factor (VIF = 10) (Pallant, 2007).

Four-step hierarchical regression analysis was done separately on each of the three dependent variables (behavioral intention) to examine those theoretical antecedents that make the most unique contributions to the TPB. This method of analysis allows the choice of predictive variables to be controlled by the researcher, rather than the computer, and explains the variability of response (Pallant, 2007). Four independent variables were tested for contributions to the model. Attitudes (step 1), subjective norms (step 2), PBC (step 3) and past behavior (step 4) were added to the regression equation to examine their contributions to the prediction of intention. Following Pallant (2007), R^2 , adjusted R^2 , R^2 change, F score change ($F\Delta$) and standardized beta (β) and final beta scores were chosen to represent the results.

Table 1. Intercorrelations between variables of interest.

Variable	<i>N</i>	μ/SD	1	2	3	4	5
Packing out trash							
(1) Intention	64	4.55/.99	–	0.45**	0.45**	0.45**	0.54**
(2) Past behavior	66	1.77/0.76		–	0.34**	0.46**	0.52**
(3) Attitude	68	4.31/1.06			–	0.34**	0.45**
(4) Norm	67	4.32/1.18				–	0.56**
(5) PBC	68	4.03/1.37					–
Burying human waste							
(1) Intention	67	3.89/1.41	–	0.30*	0.38**	0.17	0.46**
(2) Past behavior	68	2.04/0.97		–	0.55**	0.35**	0.62**
(3) Attitude	67	4.16/1.23			–	0.37**	0.56**
(4) Norm	65	4.20/1.30				–	0.37**
(5) PBC	68	4.03/1.42					–
(Refraining from) cutting trees for firewood							
(1) Intention	67	1.74/1.42	–	0.39**	0.56**	0.64**	0.28*
(2) Past behavior	68	3.57/0.70		–	0.42**	0.33**	0.28*
(3) Attitude	65	1.96/1.40			–	0.54**	0.22
(4) Norm	65	2.03/1.50				–	0.37**
(5) PBC	67	3.19/1.50					–

Note: Standard deviation (*SD*) and mean are reported as a construct average; several measures were used to measure each variable (the exception being intention to pack out trash).

* $p < 0.05$; ** $p < 0.01$.

Results

Predicting behavioral intention

Packing out trash

Table 1 shows that each variable correlated well with one another. The full four-variable model (Table 2) was a significant predictor of intentions ($p < 0.001$) and accounted for 39% (adjusted $R^2 = 34\%$) of the variability in the response while the base TPB model accounted for 37% of the variance (adjusted $R^2 = 34\%$). Attitude alone accounted for 20% of the variance (adjusted $R^2 = 19\%$, $F\Delta = 15.39$) and contributed strongly to predicting intention to pack out trash ($\beta = 0.45$, $p < 0.001$). Subjective norm explained an additional 10% (adjusted $R^2 = 9\%$, $F\Delta = 8.23$) and its addition in the second step was significant ($\beta = 0.33$, $p < 0.05$), but reduced the influence of attitude ($\beta = 0.34$, $p < 0.01$). PBC and past behavior added 7% (adjusted $R^2 = 6\%$, $F\Delta = 6.15$) and 2% (adjusted $R^2 = 1\%$, $F\Delta = 1.56$) to the total variance to the model, respectively. When all three TPB constructs were present in the model, attitude, though reduced for the second time ($\beta = 0.24$, $p < 0.05$), showed significant independent predictive capabilities, while PBC ($\beta = 0.33$, $p < 0.01$) was the strongest predictor. When past behavior was added in the fourth step of the regression analyses, significant decreases in the contribution of all three TPB constructs were found. Final beta values did not show significant independent predictive effects in the full four-variable model, with attitude and PBC just missing significance at the $p < 0.05$ level.

Burying human waste

The variables of interest correlated well with each other save for intention and subjective norm. The four-variable model was a significant predictor of intentions ($R = 0.48$,

Table 2. Hierarchical multiple regression analysis of intention.

Step	Predictor variable	R^2	^a Adjusted R^2	^b ΔR^2	β	$F\Delta$	^c Final β
Packing out trash							
$N = 64$							
1	Attitude	0.20	0.19	0.20***	0.45	15.39***	0.22
2	Norms	0.30	0.28	0.10***	0.33	8.23**	0.14
3	Control	0.37	0.34	0.07***	0.33	6.15**	0.28
4	Past behavior	0.39	0.34	0.02***	0.16	1.56	0.16
Burying human waste							
$N = 67$							
1	Attitude	0.14	0.13	0.14**	0.38	10.58**	0.20
2	Norms	0.15	0.12	0.00**	0.03	0.06	-0.03
3	Control	0.23	0.19	0.09**	0.36	6.68*	0.38*
4	Past behavior	0.23	0.18	0.00**	-0.03	0.04	-0.03
(Refraining from) cutting living trees for firewood							
$N = 67$							
1	Attitude	0.32	0.31	0.32***	0.56	27.89***	0.27*
2	Norms	0.48	0.46	0.16***	0.47	17.82***	0.45***
3	Control	0.48	0.45	0.00***	0.04	0.13	0.01
4	Past behavior	0.49	0.45	0.01***	0.12	1.36	0.12

Note: N is dependent on the number of respondents to dependent variable question.

^aAdjusted R^2 = proportion of variance explained; ^b ΔR^2 is calculated based on the change in R^2 ; ^cFinal = beta after all constructs are entered in the analyses.

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

$p < 0.01$) to bury human waste and accounted for 23% (adjusted $R^2 = 18\%$) of the variance. The theoretical antecedents of the TPB accounted for all 23% of the variance in the response (adjusted $R^2 = 19\%$). Attitude accounted for 14% of the variance (adjusted $R^2 = 13\%$, $F\Delta = 10.53$) and alone was a strong predictor of the intention to bury human waste ($\beta = 0.38$, $p < 0.01$). The addition of subjective norm was not significant and the explanation of the total variance increased by only 0.1% (adjusted $R^2 = -1\%$, $F\Delta = 0.06$). Subjective norm also reduced the influence of attitude ($\beta = 0.37$, $p < 0.05$). PBC added 9% to the variance (adjusted $R^2 = 8\%$, $F\Delta = 6.68$), while past behavior did not add to the model (adjusted $R^2 = -1\%$, $F\Delta = 0.04$). When all three TPB predictors were included in the model, PBC ($\beta = 0.36$, $p < 0.05/p < 0.02$) was the only variable that was statistically significant. When past behavior was added in the fourth step of the regression analyses, small decreases in the contribution of all three TPB constructs were noted. Final beta values show that the predictive capability of PBC increased and was the lone variable that was statistically significant ($\beta = 0.38$, $p < 0.05$).

(Refraining from) cutting living trees for firewood

The variables of interest in this model also correlated well with each other. However, the correlation between attitude and PBC was not significant. The TPB and the four-variable model performed very well and were significant predictors of intentions ($R = 0.70$, $p < 0.001$) to cut trees for firewood. The TPB accounted for 48% (adjusted $R^2 = 45\%$) of 49% (adjusted $R^2 = 45\%$) of the variance in the response. Attitudes accounted for 32% (adjusted $R^2 = 31\%$, $F\Delta = 27.89$) of the variance and alone predicted intention to cut trees for firewood ($\beta = 0.56$, $p < 0.001$). Subjective norm explained 16% (adjusted $R^2 = 15\%$, $F\Delta = 17.82$) of the

total variance and its addition in the second step was significant ($\beta = 0.47, p < 0.001$). It also again reduced the influence of attitude ($\beta = 0.31, p < 0.05$). PBC did not add to the model by itself (adjusted $R^2 = -1\%$, $F\Delta = 0.13$) and explained only 1% of the variance (adjusted $R^2 = 0\%$, $F\Delta = 1.36$) in the full model. After adding the final of the three TPB constructs to the model, PBC, attitude ($\beta = 0.31, p < 0.05$) and subjective norm ($\beta = 0.46, p < 0.001$) showed significant independent predictive capabilities of intention. When past behavior was added in the fourth step of the regression analyses, decreases in the contribution of all three TPB constructs were found. Final beta values show that attitude ($\beta = 0.271, p < 0.05$) and subjective norm ($\beta = 0.45, p < 0.001$) still had significant independent predictive effects.

Discussion and implications

The primary goal of this study was to help predict nature-based guides' intentions to perform environmentally significant behaviors on their expeditions in Garhwal. We were not sure if adventure guides in Garhwal would embrace a recreation resource management role, training and policy predicated upon research on guide populations conducted elsewhere in the world. The TPB was employed to help identify these factors that have been shown empirically to predict and explain such behavior, but the door is always open to exploration of other variables (Ajzen, 1991). The findings of this study suggest that the basic constructs of the TPB explained behavioral intentions to perform pro-environmental behavior. However, their influence was dependent on the behavior in question.

Attitude alone was a strong predictor of the intention to perform all three behaviors, suggesting that the more positive a guide's attitude, the greater is their intention to engage in pro-environmental behavior while guiding. Yet, when other predictors were added to the model, the contribution of attitude was diminished. The research of Harland et al. (1999) on pro-environmental intention reported similar findings, attributing greater influence by the other TPB variables. Ajzen and Fishbein (2004) argued that the TPB cannot predict in advance which theoretical antecedents will be of importance and that the influence of these constructs is expected to vary between behaviors and populations. Consequently, only one or two antecedents may be necessary at a time. Nonetheless, when all three primary TPB constructs were present, attitude showed significant independent predictive capabilities for packing out trash and cutting living trees for firewood. We feel that this understanding is a positive step to help clarify a potential recreation resource management role for adventure guides in Garhwal and may have implications for training and policy approaches. We do note, however, that the relationship between attitude and behavior, and the variables themselves, may be influenced by other factors, given the need to explain a range of the variance in the response of 0.69–0.87 (Jackson, 2007).

Although subjective norms have been found to be routinely outperformed in the prediction of intention by attitude and PBC (Knussen et al., 2004), they were found in our study to be significant in conjunction with attitude for packing out trash, before the addition of PBC. They were also the strongest predictor of (refraining from) cutting living trees for firewood in the final model. As suggested by the TPB, guides were more likely to say that they intended to pack out trash and refrain from cutting living trees for firewood if they were influenced by outside social sources. These results may be attributed to the adherence by guides in response to signage used to combat waste and vegetation loss in various nature tourism hot spots in Garhwal. For example, State and local forest divisions have used print messages to ban plastic and vegetation cutting and restrict beach campfires in popular areas for nature and adventure tourism in Garhwal where impacts have been heavy. Stern (2000), however, noted that a one-dimensional approach to behavior change has not proven reliable.

We feel that guides who act synergistically with the print message effort can help foster an awareness of environmental impacts (Stern, 2000). This may be accomplished by promotion of these new and emerging tourism norms and possible activation of client personal norms regarding the environment (Brown et al., 2010; Harland et al., 1999). Similarly, Wagstaff and Wilson (1988) found that a multi-strategy effort of verbal requests and role modeling by commercial river guides who operated in a remote setting resulted in more voluntary litter collection. We did not investigate the extent to which the historic Indian social system affects client–guide relationships, though it may play a key role in sustainable tourism efforts. For guides to be as effective at influencing client behavior as the whitewater rafting guides described by Wagstaff and Wilson (1988) or Roggenbuck, Williams, and Bobinski (1992), they may have to deal with social complexities that are unlike those seen in prior guide research.

PBC was the strongest predictor of packing out trash and burying human waste behavior. The findings suggest that the more control a guide feels they have over performing the behavior, the greater is their intention to perform it. Our findings are similar to the findings of other research conducted on PBC and environmentally significant behavior (Harland et al., 1999; Knussen et al., 2004; Oreg & Katz-Gerro, 2006; Tonglet et al., 2004). One caveat to these findings is that though guides' self-reported control regarding these behaviors was positive, it would not be uncommon to find that the actual behavior is not performed. Harland et al. (1999) noted that self-reported measures of behavior as well as intentions can differ from actual performance. This may be the case in Garhwal. Still, since guides show confidence in achievement of two of the three behaviors we targeted, additional inquiry should attempt to identify those resources and opportunities that influence guide control over intention to perform pro-environmental behavior.

The role of past behavior was of interest because environmentally significant behaviors can be attributed to habit or routine (Stern, 2000). Despite its recorded efficiency, past behavior did not prove to be a significant predictor of intentions in this study. One explanation may be linked to non-systematic reinforcement of these specific behaviors which results in a lack of habit formation (Verplanken, Aarts, van Knippenberg, & Moonen, 1998). Outdoor travel principles, such as Leave No Trace (see www.lnt.org), have been effective at curbing tourism and recreation impacts. They attempt to instill “wanted habits” (Verplanken et al., 1998, p. 126). Behaviors of habit among guides in Garhwal, as noted by our researchers, are burning trash and leaving food scraps behind for animals to eat. With little to no reinforcement politically, socially or culturally, new habits advocated by scholars and adopted by policymakers may likely continue to be inconsistent among guides in Garhwal. Another explanation may be our inattention to personal norms in this study. Harland et al. (1999) found that subjective and personal norms are significant for predicting not only behavioral intention, but past behavior as well.

We believe it is important to discuss the finding that the TPB did not adequately explain the intention to bury human waste. We reason that the act of human waste burial is not established among guides in Garhwal. Two parallels of non-established behavior can be found in studies on household recycling and construction waste management (Knussen et al., 2004; Teo & Loosemore, 2001). First, we believe this behavior may be viewed as a low priority among adventure guides in Garhwal due to a lack of resources and incentives to perform the behavior (Teo & Loosemore, 2001). For instance, many guides are independent contractors and provide their own equipment and operate through a local guide association. As of yet, it is not commonplace for guides to include a trowel for the purposes of human waste burial in their trip preparations (K. Bosak, personal communication, May 25, 2009). We have to ask why this might be the case and that brings us to our second parallel. The

findings of Knussen et al. (2004) showed that the low predictability of subjective norms could be due to a lack of societal pressure to recycle. As one researcher found during this study, it is common in Garhwal society to defecate and walk away, including alongside public roads and near waterways in national parks. The reality is that there is great and entrenched prejudice against handling human excreta in India (Radhakrishna, 2009). This fact, which likely impacts our attitude results, in conjunction with a lack of social pressure upon guides to perform this behavior, may point to dominant societal factors that hinder the performance of this behavior by guides. Knussen et al. (2004) also showed that certain pro-environmental behavior may give rise to negative emotions. The paradox then is the *social dilemma* (Dawes, 1980), as described by Bonnes et al. (2003) in which the global view of behavior performance is positive (e.g. avoidance of pollution, maintenance of natural area esthetics, minimization of the spread of disease), but intentions are negative as a result of personal interests (potential to contact bodily fluids, caste dictates who handles waste, effort expended to dig a cat hole, etc.).

The positive attitude results of the other two behaviors examined lead us to two recommendations to strengthen guide performance of burying human waste. As the first recommendation, we suggest that land management divisions make a concerted effort to communicate the need to perform this behavior despite the historical societal prejudice and turn negative attitudes into positive ones. At a minimum, health warnings should be posted, especially in common non-established latrines and campgrounds. The second recommendation is to expand exportation of the norm component in this instance (Armitage & Conner, 2001). There could be a wide range of external forces (Stern, 2000) not accounted for by the TPB that influence behavior performance among guides in Garhwal and they should be fully understood. These forces include a multiplicity of factors from social, cultural, political and economic spheres such as identity, values, policy and incentives (Stern, 2000).

These findings contribute to a growing body of literature on environmentally significant behavior and enhance the understanding of TPB capabilities in developing world mountain societies. Theoretically, despite the exploratory nature of our study, our findings support the documented limitations of the TPB and a general need for expansion of the theory. The growing body of literature on the affective domain in the sphere of environmentally significant behavior may further explain the intention to perform pro-environmental behavior among adventure guides in Garhwal.

Research should continue to expand the TPB and its capabilities by confronting the boundaries to behavior performance by adventure guides provided by their society and culture, which can be rooted in the affective domain. We agree with Stern (2000) that this is a process that must be intentional in its scope and operationalization to preserve a guide perspective and maintain representativeness. It is critical that environmentally significant behaviors be targeted individually and that a variety of causal variables be explored. The concentrated exploration of the TPB by scholars has revealed possible avenues for further research and may help further our understanding of guide behavior in Garhwal, such as desire (Hines, Hungerford, & Tomera, 1986), effort (Shulz & Oskamp, 1996), moral obligation (Harland et al., 1999; Kaiser, 2006; Stern et al., 1986), group influence (Fielding et al., 2008) and identity (Fielding et al., 2008).

We also noted that the performance of pro-environmental behavior may partly hinge on the fundamental theme differences central to adventure (risk and challenge) and ecotourism (location). How a guide identifies themselves (adventure or eco-guide) may influence their attitudes toward environmental behavior and perceptions of their sustainable behavior and resource management responsibility (Huang & Weiler, 2010). Since guides appear to be significant players in the mitigation of tourism impacts, uncovering this unknown would

assist in the realization of sustainable mountain tourism in Garhwal. The effect of the theme differences in adventure and ecotourism on guide attitudes toward pro-environmental behavior should be clarified with further research.

This research also discovered possible impediments to consistent performance of pro-environmental behavior in Garhwal among adventure guides, and we want to highlight practical implications for our results. We posit that guides could have a positive role in the mitigation of tourism impacts in Garhwal, “working with what they have, with what they know, and what they can do” (Nietschmann, 1997, p. 223). We believe that there are barriers to be addressed collectively by guides in Garhwal, however. Teo and Loosemore (2001) found nine impediments that inhibited the adoption of waste reduction activities in the construction industry. Several of these impediments were found to cross over to achievement of pro-environmental behavior within the guiding industry and may be useful to overcoming social impediments, establishing behavioral consistency and curbing environmental impacts. We feel that instillation and enforcement of an industry norm or performance standard; increased managerial, association, and peer commitment and support; increased expertise on the benefits of pro-environmental behavior; and increased availability of materials (e.g. a trowel) to perform such behaviors are essential to build upon what guides may already possess – positive attitudes toward pro-environmental behavior – and help achieve sustainable mountain tourism in Garhwal.

Limitations

Several limitations to this study should be mentioned. First, the TPB typically requires a pilot study be conducted prior to performing TPB research to ascertain if intercorrelations between predictor variable constructs were high. A sample of whitewater and trekking guides in the United States was surveyed prior to India to gauge questionnaire length and clarity of questions. It was decided that the significant cultural difference between American and Indian guides rendered the pilot study ineffective. The questionnaire was then worded in a general fashion to extract non-specific, yet valuable, TPB-based data. Furthermore, considering time and resource constraints, it was decided to conduct an exploratory study within the original population interest. A shortened version of the questionnaire, including the addition of the elicitation study, was produced and then translated while in India. Second, missing values were abnormally high for attitude constructs. A combination of subjects not reading the directions, poor question design and not checking for questionnaire completeness were factors. MI was used reluctantly, but found to be less biased than case deletion. Lastly, many of the studies referenced in this work were not based on Indian guide and tourist populations due to the unavailability of such research. Comparisons between indigenous guide populations should be made with caution. Further research on this and similar topics should seriously consider the cultural and societal context of the indigenous population studied in order to make a meaningful contribution to the population of interest.

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