Place-based motivations and normative beliefs predict pro-environmental behavior across involvement profiles

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ABSTRACT

Understanding the relationships among social psychological drivers of pro-environmental behavior has been the focus of a long-standing body of research aimed at minimizing human impacts on the environment. Within public land management contexts, empirical evidence has suggested that place-based motivations and normative beliefs explain why people intend to engage in behavior that benefits the environment; however, the personal relevance of outdoor activities varies, in that recreationists often report distinct degrees of involvement that influence patterns of thought and behavior. Therefore, we tested the moderating effect of enduring involvement in outdoor recreation on the relationships among motivations, normative beliefs, and pro-environmental behaviors that reflected tenets of the Leave No Trace (LNT) educational outreach program. We segmented respondents into involvement profiles and tested a series of hypothesized relationships using multi-group structural equation modeling. Data were derived from a study of white water rafters on the Kern Wild and Scenic River in California's Sierra Nevada. Results indicated that both the strength and influence of select motivations on normative beliefs are stronger among individuals with higher involvement in rafting. A relationship between respondents' stated levels of importance for achievement as a motive for activity participation and normative beliefs about LNT also emerged among respondents with medium levels of involvement, whereas normative beliefs about LNT are associated with place-based motives for being with similar people and being in nature among those with high levels of involvement. These results explain the relationships among multiple antecedents of behavior within the context of a high-risk wilderness experience.

Management implications: The behavioral phenomena examined in this research explain the development of stewardship practices to help sustain environments while optimizing visitor experiences in the outdoors. Natural resource recreation managers should consider the personal relevance of activities as defining features that explain variation in motivations and responses to normative pressure. The presented results indicate that framing information in line with the involvement profiles will be more likely to resonate with recreationists in related contexts. Respondents were motivated to engage in white water rafting to be around similar people, enjoy nature, learn, and escape from personal and social pressures, but these motivations vary in accordance with levels of involvement. In settings where recreationists are presented with opportunities to engage in nature-based recreation that requires specialized skills, those with high levels of involvement may be more sensitive to normative pressures to protect the expected outcomes of their nature-based goals and desire to be around other highly involved recreationists.

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1. Introduction

Nature-based destinations such as wilderness areas are managed to sustain opportunities for visitor experiences without compromising the integrity of ecosystems. Public land management agencies are tasked with the development of educational programs that seek to encourage the adoption of minimum-impact activities in support of these goals. Specifically, federal agencies like the U.S. Forest Service promote an environmental ethic, stewardship, and responsibility through the Leave No Trace (LNT) program (Marion & Reid, 2001). Previous research suggests the adoption of an environmental ethic—vis-à-vis the LNT principles—increases knowledge of the consequences of (in)action (Daniels & Marion, 2005) and contributes to behavior change (Clark et al., 2020). Literature also suggests that predicting intention to comply with LNT principles is useful to evaluate educational program efficacy and develop persuasive communication strategies (Vagias et al., 2014).

Enduring involvement, defined as an attachment to recreation activities (Havitz & Dimanche, 1997; Johnson & Eagly, 1989), is a particularly useful construct for understanding the development of an environmental ethic because the extent to which people view nature-based activities as relevant, important, and central to a lifestyle influences their propensity to subscribe to environmentalism (Kyle et al., 2004). That is, people are more likely to protect environments that support their desired activities because they imbue these contexts with elements of the self (Sherif & Hovland, 1961). Previous research has also indicated that ego-involvement influences the importance an individual ascribes to preferences for recreation experiences (Funk et al., 2004; Kyle et al, 2002, 2006; Ritchie et al., 2010), and moderates the relationship between moral normative concerns and pro-environmental behavior (Bamberg & Schmidt, 2003). However, there is no empirical evidence of the combined effects of these variables on behavior change. Therefore, this study examined multiple predictors of LNT behaviors, particularly place-based motivations and normative beliefs, across subgroups of survey respondents defined by their involvement profiles.

1.1. Leave No Trace and normative beliefs

The LNT education and outreach program instills knowledge in stakeholder groups that supports pro-environmental behavior (PEB) defined as actions performed with the intention of benefiting the environment (Gifford & Nilsson, 2014; Steg & Vlek, 2009). Specifically, this program identifies appropriate behaviors that minimize tourism and recreation-related impacts through seven principles: 1) travel and camp on durable surface, 2) plan ahead and prepare, 3) be considerate of other visitors, 4) respect wildlife, 5) minimize campfire impacts, 6) leave what you find, and 7) dispose of waste properly (Marion & Reid, 2001; Vagias et al., 2014). The LNT program offers an educational strategy for public land management agencies in the U.S. (Lawhon et al., 2019) and espouses principles that have been adapted in previous research to measure behavioral intentions (van Riper et al., 2020). As an indirect management tactic (Manning, 2003), outreach efforts informed by the LNT program aim to provide a foundation for environmental communication about the ethics of nature-based recreation (Marion, 2014).

There are multiple theoretical foundations for studying actions that benefit the environment such as those outlined within the LNT program. The concept of "norms" is instrumental in distinguishing among these research traditions (Farrow et al., 2017; Niemiec et al., 2020). One vein of research suggests that "personal norms" reflect a sense of moral obligation outlined in the Norm Activation Model (Schwartz, 1977) and Value-Belief-Norm Theory (Stern, 2000) and are direct antecedents to reported behavior. Another research stream builds from the Theory of Planned Behavior (Fishbein & Ajzen, 2011) and indicates that the concept of "subjective norms," defined as perceived social pressures, explains behavioral intentions (Reigner & Lawson, 2009; Vagias et al., 2014; Mueller et al., 2018). Although these research traditions differ in their assumptions about how people process information (Kaiser et al.,

2005), both provide a theoretical basis for understanding "normative beliefs," which we define as an individual's understanding of the behaviors and evaluations of others in a social setting (Schultz et al., 2008; Nolan & Wallen, 2021). There is a growing body of work that seeks to understand how these normative beliefs explain various PEBs such as water conservation (Göckeritz et al., 2010), fisheries management (Crandall et al., 2018), and public lands management (Daxini et al., 2018).

1.2. Place-based motivations

Human behavior has been better understood through previous research focused on motivations (Becker et al., 1972; Childers et al., 2001; Kyle et al., 2006). One theoretical basis underpinning motivation is the expectancy-valence theory, which was originally developed to understand what compels people in the workplace to perform tasks (Lawler, 1973; Vroom, 1982). According to this theory, individuals within organizations are assumed to follow conscious processes and make rational choices among behavioral alternatives that will most likely yield desired outcomes. Specifically, individuals are assumed to make decisions based on outcome preferences (i.e., valences) and their estimations (i.e., expectancies) that an outcome will be achieved (Nadler & Lawler, 1977). Motivations can also be understood from the perspective of Maslow's et al. (1970) hierarchy of human needs to explain why benefits are desired and needed for self-actualization. Building on this premise, Iso-Ahola (1980) established a model to demonstrate the range of factors that motivate behavior, including activities that "push" (i.e., factors that predispose people to action) and "pull" (i.e., factors that attract people to places) individuals into leisure experiences for attaining benefits, respectively. Higher motivations are therefore associated with greater benefits and the perceived likelihood that effort will lead to rewards bestowed on an individual (Rice et al., 2020).

The Recreation Experience Preference (REP) scale was developed by Driver and Tocher (1970) to measure place-based motivations as the expected outcomes an individual attains from experiencing recreation in a specific setting. This scale contains more than 300 motivations that have been reduced to 19 domains such as exploration, nature, experience, risk-taking, and being with similar people (Manfredo et al., 1996). In the context of nature-based recreation, the REP scale has been used to explain why individuals engage in various behaviors (Manning, 1999; Needham & Rollins, 2005). Researchers have observed that there are diverse motivations for participating in high-risk and water-based recreation (O'Connell, 2010). For example, Stein, Denni, and Pennisi (2003) found that being with family, escaping personal/social pressures, and relaxation were common motivations to visit serene freshwater springs in central Florida. Additionally, Ewert et al. (2013) found that social, sensation-seeking, and self-image motivations were important for engaging in adventurous pursuits such as kayaking and climbing. These findings highlight the importance of context in influencing motivations to engage in nature-based activities given the range of anticipated outcomes provided by a setting.

1.3. Involvement in outdoor recreational research

Enduring involvement is a concept drawn from social psychology and consumer behavior literature that has been applied to understand outdoor recreationists' relationships with leisure activities, brands, and service providers. High levels of involvement have corresponded to strong relationships within communities, achievement of organizational goals, and participation in recreation activities over time (Iwasaki & Havitz, 2004; Kyle & Chick, 2004). Because involvement has been related to retention rates in recreation (Gahwiler & Havitz, 1998), researchers have studied its connections to other social psychological constructs that underpin behavior to support decision-making. For example, Kyle et al. (2006) studied the antecedents of enduring

involvement among campers in a U.S. national forest and found that place-based motivations predicted involvement. Although these authors provided empirical evidence of the motivation-involvement relationship, they argued that motivations were specific to activities, thus, calling for more research to strengthen the process of generalizing from unique cases to higher levels of abstraction.

Past research has considered variation in involvement as a basis for creating consumer profiles and increasing understanding of recreation behavior. For example, Kyle et al. (2002) created involvement profiles of 10 km road race participants based on variables related to participation, psychographics, and socio-demographics. Findings demonstrated the utility of segmentation and underscored the complexity of both type and degree of involvement in shaping behavior. Although there was mixed support for their hypotheses, the authors concluded that research using involvement profiles can provide managers with insights about the underlying motives for participation in an activity. McIntyre and Pigram (1992) also showed that segmenting vehicle-based campers into subgroups based on different levels of involvement explained variation in attitudes of campers toward management strategies. More recently, Ritchie et al. (2010) found that profiling bicyclists by their levels of involvement elucidated the relationships among socio-demographics, motivations, and behavior. These studies demonstrate that involvement can be a useful construct for understanding preference heterogeneity, particularly among outdoor recreationists.

Involvement has been approached as a multi-dimensional construct in previous research. McIntyre (1989) characterized involvement as having three dimensions that were later expanded into a five-factor Modified Involvement Scale (Kyle et al., 2007) that included attraction, centrality, social bonding, identity affirmation, and identity expression. Attraction measured the importance and enjoyment of a given activity to an individual, centrality was related to the lifestyle choices an individual made that related to an activity, and social bonding described the social connections that tie the individual to that activity. Identity affirmation and expression were originally conceived by McIntyre (1989) and measured the extent to which recreational opportunities affirm self-identity and allow individuals to express their identity to others, respectively.

1.4. Connecting multiple predictors of LNT behavior

Previous research has suggested motivations are related to normative beliefs that influence behavior (Kil et al., 2014; Kim et al., 2003; Celsi et al., 1993). People who are motivated to act in pro-environmental ways derive satisfaction from knowing that they are bettering the environment (Bolderdijk et al., 2013; Taufik et al., 2015; Kastner & Stern, 2015). Needham et al. (2011) measured how place-based motivations to engage in summer recreation predicted tourists' evaluations of the perceived acceptability of social and environmental conditions of an alpine ski resort. Graefe et al. (1981) and Schreyer and Roggenbuck (1978) also found that motivations of river users were related to normative preferences for recreation experiences. Findings from these studies support further investigation of the connections between motivations and normative beliefs.

Goal Framing Theory (Lindenberg & Steg, 2013) can provide a conceptual basis for understanding how motivations influence the well-defined relationship between normative beliefs and behavior established in previous research guided by the Theory of Planned Behavior (Fishbein & Ajzen, 2011) and Norm Activation Model (Schwartz, 1977). Goal Framing Theory posits that the way individuals select, process, and act upon information is dependent on the strength of their broader goals or motives (Lindenberg 2001, 2006, pp. 23–44). There are three types of goals recognized by this theory including the hedonic goal to feel better, the gain goal to increase one's resources, and the normative goal to act appropriately and do that which is deemed morally correct. Various situational and contextual factors will determine the relative strength of each goal when an individual weighs a

decision to engage in behavior (Steg et al., 2014). When normative goals are relatively pronounced, an individual carefully considers the judgments of their peers and, thus, will be more likely to act in line with normative pressures (Steg, 2016).

A series of hypotheses were formed in response to the aforementioned bodies of research. Drawing on Goal Framing Theory (Lindenberg & Steg, 2013), six dimensions of place-based motivations were hypothesized to predict normative beliefs, which were hypothesized to positively influence intentions to engage in LNT behaviors (Fishbein & Ajzen, 2011; Schwartz, 1977). The structural relationships among motivations to achieve goals, normative beliefs, and behavioral intentions were also hypothesized to differ across subgroups defined by involvement (Kyle et al., 2006, 2007). This study aimed to provide guidance for public land managers on the factors that influence decisions to act pro-environmentally within the context of a nature-based recreation setting.

2. Methods

2.1. Study context

Data for this study were collected on the Kern River, which is a popular rafting destination in the Southern Sierra of California, U.S. The Kern River flows from a low of 100 cubic feet per second to a high of 900 cubic feet per second. This river was designated a National Wild and Scenic River by the U.S. Congress in 1987 due to its aesthetic qualities and plethora of recreational opportunities, including white water rafting. The Kern River has a section of 20.9 miles designated as recreational and 123.1 miles designated as Wild and Scenic, totaling 151 miles of river managed primarily by the U.S. Forest Service. The government-owned concessions on the Kern River support a multitude of functions. For example, this river is a municipal water supply for local residents and supports one of the most productive agricultural areas in the U.S. Recreation on the Kern is managed on a permitting system spread across several different companies that use water resources to generate hydroelectric power and provide recreational experiences such as rafting and kayaking. In 2014, when data were collected, three white water rafting and kayaking concessionaires were in operation. These rafting companies provided recreational experiences that involved teaching visitors about equipment, safety, transportation, and skills for navigating the river. These companies embraced the principles of the LNT program with the aim of promoting the adoption of sustainable, minimal impact activities.

2.2. Survey administration

Self-administered surveys were distributed to individuals who engaged in white water rafting activities from April–July 2014. A total of 584 persons were contacted on site by two trained administrators and 520 agreed to participate, yielding an 89% response rate for the initial point of contact. Contact logs were used to collect data on all potential respondents to check for non-response bias. Follow-up, mixed mode surveys were delivered via postage mail and email to the 520 respondents in three separate waves. Of the surveys administered, 242 were completed, resulting in an overall response rate of 48%.

2.3. Measurement and analysis

Scales that measured involvement, place-based motivation, normative beliefs, and PEB were drawn from past research. We measured involvement using ten items adapted from the modified involvement scale (Kyle et al., 2007), which included three dimensions: 1) attraction, 2) social bonding, and 3) identity. Six domains from the REP were selected due to their relevance to the activity and study context: 1) achievement, 2) risk-taking, 3) similar people, 4) learning, 5) enjoy nature, and 6) escape personal/social pressures. Achievement and

escape personal/social pressure were measured by two items and the remaining four motivations were measured using three items. Normative beliefs were also measured using three items adapted from the subjective norm tradition in the Theory or Planned Behavior (Fishbein & Ajzen, 2011) and the premise of the Norm Activation Model (Schwartz, 1977). To evaluate behavioral intentions, seven LNT principles identified by Marion and Reid (2001) were adapted to a white water rafting context (van Riper et al., 2020). Dichotomous questions (yes/no) were asked to determine whether the respondent intended to engage in specific activities in the 12 months following the completion of the survey in response to what they learned from their rafting guides.

Confirmatory factor analysis (CFA) was used to test the hypothesized structure of involvement, place-based motivations, and normative beliefs. Our models were estimated using a maximum likelihood estimation procedure and missing data were accounted for using the full information maximum likelihood method. A chi-square test was referenced, alongside other fit statistics to determine the fit of the model to the sample data (Kline, 2015). Root Mean Square Error of Approximation (RMSEA) values less than 0.08 indicated acceptable fit (Steiger, 2007), Comparative Fit Index values over 0.90 were accepted (Bentler, 1990), and Standardized Root Mean Square Residual (SRMR) values less than 0.08 were considered acceptable (Hu & Bentler, 1999). All constructs of interest had adequate internal consistency (Cronbach's alpha > 0.60; Cortina, 1993), composite reliability (CR > 0.60; Bagozzi & Yi, 1988), and average variance explained (AVE > 0.50; Fornell & Larcker, 1981). Analysis was conducted in R (version 3.6.1) using the *lavaan* package (version 0.6–5) (Rosseel, 2012).

We conducted a latent profile analysis to identify subgroups of respondents that were similar in their involvement in white water rafting. Mean factor scores were created for each of the three dimensions of involvement and then we estimated multiple different classifications. We evaluated the best fitting model using several metrics including Bayesian Information Criterion (BIC), Integrated Complete-data Likelihood (ICL), entropy, and the Bootstrapped Likelihood Ratio Test (BLRT) (Biernacki et al., 2000). Entropy values near or greater than 0.80 (Tein et al., 2013) and significance of the BLRT value indicated the addition of another latent profile did not improve model fit (McLachlan, 1987). After model selection, respondents were assigned to classes based on the highest probability of class membership, and then mean differences in involvement among the classes were evaluated using ANOVA with a Tukey multiple comparison test. All latent profile analyses were conducted in R using the *mclust* package (Scrucca et al., 2016).

To test the structural relationships among place-based motivations, normative beliefs, and LNT behaviors, we parceled factor item means and tested a manifest variable regression model. Item parceling was used in the final model because of model complexity and this process consisted of computing average factor scores across each of the place-based motivation and normative belief factors (Bandalos, 2008). After parceling, we estimated a structural regression model using the pooled sample of survey respondents and then evaluated a multiple group model. We evaluated model fit using the same criteria applied to evaluate our CFAs. Lastly, we evaluated the multiple group model differences by assessing beta path coefficient invariance across involvement profiles by constraining path coefficients to be equal and assessing changes in model fit with a chi square difference test (Vandenberg & Lance, 2000).

3. Results

3.1. Socio-demographics

Most respondents were White (79%) and males (62%), with an average age of 43 ($SD = 10.66$) (see Table 1). The majority of the sample was highly educated, in that 75% reported having obtained a graduate degree or a four-year college degree, and 28% reported incomes between $100,000 and $149,999 USD before taxes. A total of 15%

Table 1
Socio-demographic characteristics of white water rafters on the Kern River in the Southern Sierra Nevada,CA.

Variable		Valid Percent
Gender	Male	61.6
	Female	38.4
Race	American Indian/Native	3.5
	Asian	14.7
	White	79.1
	Black/African American	3.1
	Native Hawaiian/Pacific Islander	2.2
	Other	6.2
Educational attainment	Less than high school	0.4
	High school graduate	6.5
	Vocation/Trade school certificate	7.3
	Two-year college degree	11.2
	Four-year college degree	37.1
	Graduate degree	37.5
Annual Income	Less than $20,000	2.3
	$20,000 - $49,999	14.4
	$50,000 - $99,999	31.9
	$100,000 - $149,999	28.2
	$150,000 - $199,999	8.8
	Greater than $200,000	14.4
Age *(M, SD)*		43 (10.6)

identified as Asian, 4% identified as Native American, 3% as African American, 2.2% as Pacific Islander, and 6% as "Other." Respondents intended to engage in the majority of LNT activities in the coming year in response to their river rafting experience, as reflected by a summative score of 5.10 out of 7.00 ($SD = 1.80$).

3.2. Structural equation modeling results

Modeling results from a confirmatory factor analysis (CFA) indicated adequate fit for our measurement model of place-based motivations and normative beliefs ($\chi^2 = 262.72$, df = 114; RMSEA = 0.08; CFI = 0.93; SRMR = 0.06) (see Table 2). All factor loading scores were above 0.40 except for one item that measured similar people which was dropped from analysis ($\Delta\chi^2 = 28.37$, $p = .04$; Hair et al., 1998, pp. 207–219). A CFA was also estimated prior to creating factor scores for the latent profile analysis to evaluate the measurement properties of our involvement scale. We found acceptable model fit ($\chi^2 = 33.89$, df = 16; RMSEA = 0.07; CFI = 0.98; SRMR = 0.03) (see Table 3). Upon evaluating the possible solutions, two classes showed the lowest BIC and ICL values; however, entropy was low and the BLRT test did not show significant improvement in model fit. A three-class solution was therefore selected because it had better BIC and ICL values than a four-class solution, higher entropy, a significant BLRT value, and more equal distribution of respondents across profiles (see Table 4). This three-class solution enabled us to classify respondents as either low (24%), medium (56%), or high (20% of respondents) in their involvement levels. Respondents in each class significantly differed in their involvement scores ($p < .001$), except for high and medium involvement on the dimension of attraction (see Table 5).

3.3. Structural regressions and groups comparison

After parceling all scale items, our final pooled structural regression model showed adequate fit ($\chi^2 = 9.35$, df = 6; RMSEA = 0.05; CFI = 0.90; SRMR = 0.04). In the pooled sample, similar people positively predicted normative beliefs ($\gamma = 0.205$, p < .001) and normative beliefs positively predicted LNT behaviors ($\beta = 0.228$, p < .001), accounting for 11% of the variance in normative beliefs and 5% in LNT behavior (see Table 6, Fig. 1). Mediation analysis revealed that the indirect effect of similar people on LNT behavior was statistically significant ($\beta = 0.047$, p = .045).

The groups comparison model fit the data ($\chi^2 = 20.24$, df = 18;

Table 2
Means, standard deviations (SD), reliability estimated including Cronbach's alpha (α), composite reliability (CR) and average variance explained (AVE), standardized factor loading scores, and z-values for scale items measuring motivations and normative beliefs among respondents in the pooled sample and three subgroups defined by involvement.

Scale items	Pooled Sample	Low Involvement	Medium Involvement	High Involvement	λ	z-value
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)		
Place-based motivations[a]						
Achievement ($\alpha = 0.79$, CR = 0.83, AVE = 0.71)	*2.43 (1.10)*	*2.02 (0.83)*	*2.47 (1.14)*	*2.80 (1.11)*		
To gain a sense of self confidence	2.19 (1.18)	1.73 (0.92)	2.25 (1.22)	2.53 (1.20)	0.67	10.17
To test the extent to which I can do it	2.67 (1.24)	2.32 (1.18)	2.68 (1.24)	3.07 (1.22)	0.98	14.97
Risk-taking ($\alpha = 0.90$, CR = 0.91, AVE = 0.77)	*2.46 (1.13)*	*2.10 (1.00)*	*2.52 (1.11)*	*2.70 (1.24)*		
To take risks	2.58 (1.22)	2.29 (1.15)	2.59 (1.20)	2.87 (1.27)	0.83	14.86
To chance dangerous situations	2.26 (1.24)	1.83 (1.02)	2.34 (1.23)	2.51 (1.41)	0.94	18.16
To experience the risks involved	2.55 (1.24)	2.15 (1.19)	2.64 (1.20)	2.73 (1.27)	0.85	15.63
Similar People ($\alpha = 0.48$, CR = 0.52, AVE = 0.37)	*3.61 (1.00)*	*3.52 (1.13)*	*3.62 (0.98)*	*3.71 (0.88)*		
To be with friends	3.97 (1.13)	3.95 (1.21)	3.89 (1.18)	4.20 (0.83)	0.45	5.26
To be with people having similar values	3.25 (1.31)	3.08 (1.36)	3.33 (1.29)	3.22 (1.28)	0.70	6.49
Learning ($\alpha = 0.80$, CR = 0.82, AVE = 0.61)	*3.71 (0.92)*	*3.43 (0.99)*	*3.81 (0.85)*	*3.73 (0.99)*		
To develop my knowledge of rafting	3.10 (1.22)	2.60 (1.29)	3.20 (1.17)	3.42 (1.14)	0.56	8.74
To experience new and different things	4.10 (0.95)	3.99 (1.01)	4.20 (0.85)	3.96 (1.13)	0.88	16.09
To discover something new	3.91 (1.09)	3.70 (1.31)	4.04 (0.98)	3.80 (1.07)	0.92	17.06
Enjoy Nature ($\alpha = 0.93$, CR = 0.94, AVE = 0.83)	*3.94 (0.94)*	*3.79 (0.94)*	*3.93 (0.97)*	*4.13 (0.82)*		
To view the scenery	4.01 (0.92)	3.82 (0.94)	4.04 (0.91)	4.16 (0.85)	0.85	15.64
To be close to nature	3.98 (1.01)	3.87 (1.01)	3.95 (1.06)	4.20 (0.80)	0.96	19.07
To enjoy the smells and sounds of nature	3.84 (1.09)	3.71 (1.09)	3.83 (1.12)	4.04 (0.97)	0.91	17.62
Escape ($\alpha = 0.81$, CR = 0.81, AVE = 0.68)	*3.77 (1.07)*	*3.49 (1.08)*	*3.85 (1.09)*	*3.88 (0.94)*		
To give my mind a rest	3.59 (1.22)	3.32 (1.20)	3.68 (1.26)	3.67 (1.11)	0.83	12.60
To get away from the usual demands of life	3.96 (1.10)	3.67 (1.12)	4.03 (1.06)	4.09 (1.05)	0.82	12.41
Normative beliefs[b] ($\alpha = 0.63$, CR = 0.69, AVE = 0.47)	*4.07 (0.65)*	*3.92 (0.71)*	*4.14 (0.60)*	*4.04 (0.70)*		
Most others in my group feel it is important to avoid disturbing wildlife	4.25 (1.04)	4.09 (0.87)	4.32 (0.69)	4.22 (0.87)	0.59	6.45
Others in my group feel I should do whatever I can to avoid trampling sensitive vegetation near put-in and take-out locations	3.72 (1.69)	3.67 (1.04)	3.74 (0.94)	3.71 (1.64)	0.87	7.62
My guide would not approve of my negatively impacting the health of the river	4.24 (0.97)	4.02 (1.01)	4.35 (0.69)	4.20 (0.95)	0.40	5.04

Note. Final CFA model fit: $\chi^2 = 262.72$, df = 114; RMSEA = 0.08; CFI = 0.93; SRMR = 0.06.
[a] Scales evaluated on a Likert scale where 1 = "Not at all Important" and 5 = "Extremely Important."
[b] Scales evaluated on a Likert scale where 1 = "Strongly Disagree" and 5 = "Strongly Agree".

Table 3
Means, standard deviations (SD), reliability estimated including Cronbach's alpha (α), composite reliability (CR) and average variance explained (AVE), standardized factor loading scores, and z-values for scale items measuring involvement among survey respondents.

Scale items	Mean (SD)	λ	z-value
Involvement[a]			
Attraction ($\alpha = 0.89$, CR = 0.89, AVE = 0.74)	*3.25 (0.87)*		
Rafting is one of the most enjoyable things I do	3.49 (0.91)	0.80	14.27
Rafting is very important to me	3.13 (0.95)	0.85	15.31
Rafting is one of the most satisfying things I do	3.12 (1.00)	0.91	17.17
Social Bonding ($\alpha = 0.59$, CR = 0.62, AVE = 0.46)	*2.48 (0.88)*		
I enjoy discussing rafting with my friends	3.04 (1.17)	0.74	10.75
Most of my friends are in some way connected with rafting	1.93 (0.91)	0.58	8.56
Identity ($\alpha = 0.82$, CR = 0.84, AVE = 0.63)	*2.60 (0.95)*		
I identify with the people and the image associated with rafting	2.69 (1.10)	0.69	11.07
You can tell a lot about a person by seeing them rafting	2.54 (1.04)	0.81	13.98
Participating in rafting says a lot about whom I am	2.55 (1.13)	0.88	15.56

Note. Final CFA model fit: $\chi^2 = 33.89$, df = 16; RMSEA = 0.07; CFI = 0.98; SRMR = 0.03.
[a] Scales evaluated on a Likert scale where 1 = "Strongly Disagree" and 5 = "Strongly Agree."

RMSEA = 0.04; CFI = 0.95; SRMR = 0.05) and invariance tests of the regression coefficients indicated that constraining regression paths to be equal across the three profiles resulted in significantly worse model fit ($\Delta\chi^2 = 30.09$, $p = .007$; see Table 7). Therefore, we concluded the regression paths should be freely estimated. The final groups

Table 4
Latent profile analysis model results including information criteria, entropy, likelihood ratio tests, and class probabilities based on involvement.

Fit Statistics	2-Classes	3-Classes	4-Classes
Log-likelihood	−768.90	−759.32	−752.50
df	16	23	30
BIC	−1624.73	−1643.61	−1668.02
ICL	−1686.18	−1711.72	−1755.32
Entropy	0.61	0.73	0.71
BLRT test	9.17	19.15	13.63
BLRT *p*-value	0.49	0.05	.26
Class 1 (*n, %*)	53, 24%	54, 24%	29, 13%
Class 2 (*n, %*)	176, 76%	130, 56%	90, 39%
Class 3 (*n, %*)	–	45, 20%	48, 20%
Class 4 (*n, %*)	–	–	62, 28%

Note: BIC = Bayesian Information Criterion, ICL = Integrated Complete-data Likelihood, BLRT = Bootstrap Likelihood Ratio Test.

Table 5
Mean variation in involvement scores across latent classes and ANOVA results.

	Class 1: Low Involvement	Class 2: Medium Involvement	Class 3: High Involvement	*F*-value
Attraction	2.73[a]	3.38[b]	3.47[b]	14.09***
Social Bonding	1.32[a]	2.58[b]	3.57[c]	286.70***
Identity	1.77[a]	2.67[b]	3.37[c]	52.17***

Note: All post-hoc pairwise comparisons adjusted using Tukey multiple comparisons test, all comparisons significant at $p < .001$ except high and medium involvement classes on attraction. Different superscripts indicate significant differences among classes.
***$p < .001$.

Table 6
Structural regression coefficients for the pooled sample of survey respondents.

Dependent variable	Predictor variable	γ	β	z-value	R^2
Normative beliefs	*Achievement*	0.08		0.90	0.11
	Risk-taking	-0.08		−1.08	
	Similar people	0.21**		2.94	
	Nature	0.01		0.09	
	Learn	0.06		1.10	
	Escape	0.04		1.38	
LNT Behavior					0.05
	Normative beliefs		0.23***	3.26	

γ = standardized regression coefficients between exogenous and endogenous constructs; β = standardized regression coefficient between endogenous constructs. Note. Final structural model fit: $\chi^2 = 9.35$, df = 6; RMSEA = 0.05; CFI = 0.90; SRMR = 0.04.
**$p < .01$, ***$p < .001$.

comparison model revealed that no paths were significant for the low involvement profile. For respondents with medium levels of involvement, achievement was a significant predictor of normative beliefs ($\gamma = 0.224$, $p = .037$), and normative beliefs predicted LNT behavior ($\beta = 0.189$, $p = .041$), accounting for 12% of the variance in normative beliefs and 4% in LNT behavior. Lastly, for the high involvement profile, both similar people ($\gamma = 0.486$, $p < .001$) and nature ($\gamma = 0.384$, $p = .006$) were significant predictors of normative beliefs, and normative beliefs significantly predicted LNT behavior ($\beta = 0.327$, $p = .024$), accounting for 49% of the variance in normative beliefs and 11% in LNT behavior. Mediation analysis revealed that no indirect effects in the multi-group comparison models were statistically significant.

4. Discussion

This study examined the relationships among place-based motivations, normative beliefs, and behavioral intentions among survey respondents who were segmented into three subgroups defined by their involvement in white water rafting on the Kern River in the Southern Sierra Nevada, CA, U.S. Results confirmed that a suite of place-based motivations to engage in the recreation activity of white water rafting influenced normative beliefs, which in turn affected intentions to engage

in LNT behaviors. These findings extend past research that has sought to understand the role of place-based motivations in explaining multiple predictors of PEB and supporting decision-making in public land management contexts (Anderson et al., 2008; O'Connell, 2010).

Our results showed that respondents considered multiple social psychological factors when weighing their intentions to engage in behaviors that reflected the ethical principles taught by their river rafting guides. One of the foundational concepts that influenced this process was motivations defined as expectations for personal gain (Lawler, 1973) and the utility of a site for goal attainment (Lindenberg & Steg, 2007). Specifically, we observed that two of the six REP domains assessed in this study, including nature and similar people, significantly influenced normative beliefs among those most involved with white water rafting, indicating that these recreation experience preferences were most important in explaining why recreationists responded to normative pressures that in turn steered behavior. Given that the nature-based setting of the Kern pulled recreationists from their everyday lives into a leisure experience (Kim et al., 2003; Alexandris et al., 2009), results intuitively showed that motivations related to experiencing nature were positively correlated with the norm-behavior relationship. It could be that individuals motivated to experience nature had normative goals to act in accordance with what was considered morally beneficial for the environment (Steg, 2016), thus protecting expected outcomes and places that reflect the self (Sherif & Hovland, 1961; Kyle et al., 2006).

Table 7
Summary of invariance testing between groups.

Model	χ^2	Df	$\Delta\chi^2$	Δdf	RMSEA	CFI	TLI
Multigroup structural model	20.24	18	–	–	0.041	0.950	0.891
Invariant regression coefficients	50.33	32	30.09**	14	0.087	0.587	0.497
Final Model	20.24	18	–	–	0.041	0.950	0.891

**$p < .01$.
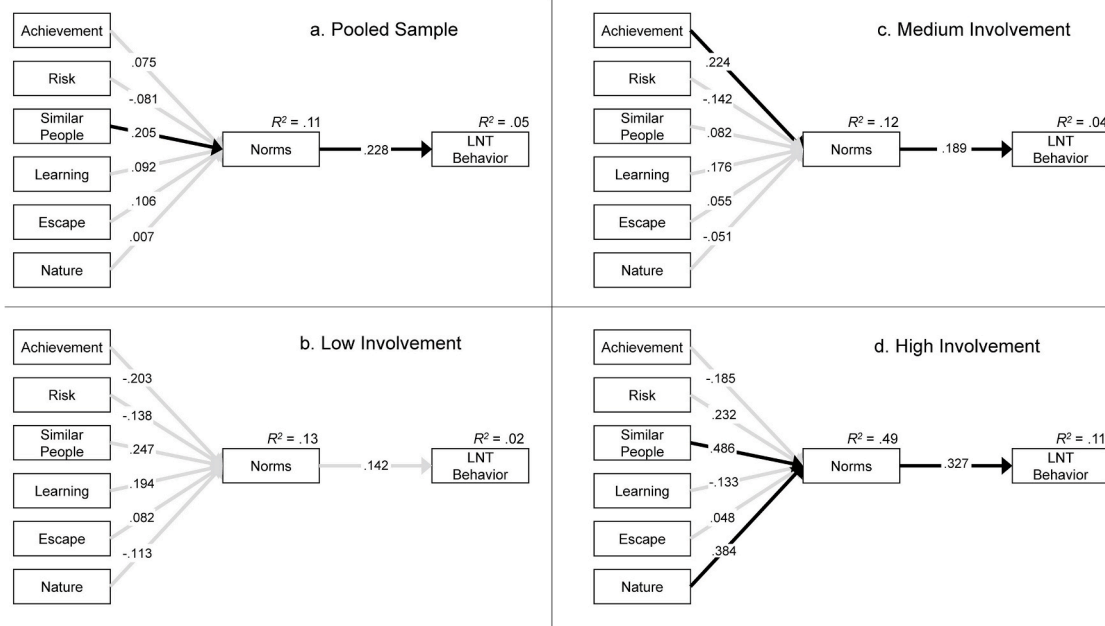
Fig. 1. Research results from a structural equation model for the (a) pooled sample and multigroup comparison for (b) low involvement, (c) medium involvement, and (d) high involvement classes predicting intended leave no trace pro-environmental behavior. Solid black lines indicate significant relationships ($p < .001$) and gray lines indicate non-significant relationships.

This study recognized multiple dimensions of motivations and extended previous efforts to establish a benefits-based framework for managing visitor experiences (Rice et al., 2020). Being with similar people was one of the motivations to engage in white water rafting that positively influenced normative beliefs and intentions to engage in PEB. One explanation is that the referent used in the measurement of normative beliefs related to others, which aligned with the goal of being surrounded by similar people. In line with the assumptions of Goal Framing Theory, it could be that as this goal became stronger, respondents were more likely to adhere to social norms that defined appropriate behavior (Lindenberg & Steg, 2007). This logic extends to the finding that as normative beliefs increased, so did intentions to engage in behaviors that benefited the environment. In this sense, both social pressure and moral normative concerns increased the likelihood of compliance with behaviors outlined in the LNT program. Moreover, river rafting guide companies imparted knowledge about the program during the rafting experience, which may have increased awareness of the consequence of inaction and responsibility at the individual level, as posited by the Value-Belief-Norm Theory and Norm Activation Model (de Groot & Steg, 2009; Stern, 2000). However, we suggest that the outcome expectations of respondents in the resource recreation management context of the present study varied over the course of an experience (van Riper & Kyle, 2014). That is, outdoor recreationists likely engaged their beliefs in different ways throughout a given trip on the Kern River.

Building on previous research (Havitz & Dimanche, 1997; Kyle et al., 2006, 2007), this study reinforced the multi-dimensional conceptualization of involvement that includes a three-tiered hypothesized factor structure. The attraction basis for involvement was stronger than social bonding and identity, indicating that importance and pleasure of white water rafting were particularly relevant bases for the cognitive linkages that formed between respondents and the stimulus object (i.e., activity) (McIntyre & Pigram, 1992). This factor structure emerged as a useful basis for understanding variation in the relationships between motivations and normative beliefs that influenced LNT behavioral intentions. Specifically, the personal relevance of a recreation activity provided insight on patterns of motivations and normative beliefs at the individual level (Sherif & Hovland, 1961).

We observed that motivations tended to increase across the three subgroups defined by their involvement, indicating that respondents who were more ego-involved in rafting felt stronger motivational forces that pushed and pulled them into this activity (Moore & Driver, 2005). For the highly involved subgroup, the influence of similar people most strongly related to their desire to share time with others that had similar ethos about the river, being in nature, and protecting the health of the environment. By contrast, survey respondents classified as having medium levels of involvement held the strongest normative beliefs and saw achievements such as completing a river rafting run as most compelling. For the low involvement group, there were likely low expectations for what could be obtained from participation in white water rafting. Because the goals for the low involvement subgroup were less salient, goal attainment was likely more ambiguous. The same holds for normative beliefs, in that rafting had lower personal relevance for these individuals so awareness of normative beliefs governing river etiquette was likely low. These findings can be considered by public land management agencies to improve the design of programs and experiences in settings to align with a range of behavioral phenomena among relevant stakeholders, particularly among people who recreate on Wild and Scenic Rivers in the U.S.

5. Conclusions and management implications

This research explored the relationships among multiple drivers of LNT behavioral intentions using a two-step structural regression model and invariance testing. Our modeling results indicated that the greater the opportunities to be in nature and with similar people, the more likely respondents would be to hold normative beliefs, which in turn influenced intended behaviors. These patterns changed in accordance with the involvement levels of survey respondents. Study findings are directed toward public land management agencies such as the U.S. Forest Service that establish contracts with guiding companies. Managers in these agencies set overall guidance and administrative rules (e. g., training, communications, printed material), which notably include permitting processes for commercial operations. However, most outreach is implemented by companies and often unobserved staff members. Although the present study generated useful insights for agencies that seek to encourage behaviors in line with educational outreach programs such as LNT (Clark et al., 2020; Marion & Reid, 2001), this separation between the agency and individual guides should be carefully considered, because it can lead to variation and even bias in particular outcomes valued by a company.

Natural resource recreation managers should consider the personal relevance of activities as defining features that explain variation in motivations and responses to normative pressure. Our results indicate that framing information in line with the involvement profiles identified in this study will be more likely to resonate with recreationists in related contexts. Further, it should be noted that respondents were motivated to engage in white water rafting to be around similar people, enjoy nature, learn, and escape from personal and social pressures, but these motivations vary in accordance with levels of involvement. In settings such as the Kern River Valley where recreationists are presented with opportunities to engage in nature-based recreation that requires specialized skills, those with high levels of involvement may be more sensitive to normative pressures to protect the expected outcomes of their nature-based goals and desire to be around other highly involved recreationists. The behavioral phenomena examined in this research therefore explain the development of stewardship practices such as those outlined in the LNT program in an effort to help sustain environments while optimizing visitor experiences in the outdoors.

Acknowledgements

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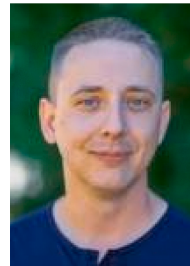
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