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PROENVIRONMENTAL BEHAVIOR: CRITICAL LINK BETWEEN SATISFACTION AND PLACE ATTACHMENT IN AUSTRALIA AND CANADA

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This study explores issues of scale equivalence and generalizability in national parks. Visitors' place satisfaction, proenvironmental behavior, and place attachment are measured across two qualitatively distinct populations in Australia and Canada. Techniques employed in this cross-country study bring an important contribution to tourism research. The primary focus is to establish measure equivalence before undertaking hypothesis testing using structural equation modeling on a sample of 339 repeat visitors at the Dandenong Ranges National Park, Australia, and 296 repeat visitors at the Bruce Peninsula National Park, Canada. Results from both samples indicate (a) there is measure equivalence between the Australian and Canadian samples allowing comparability of findings, (b) a positive and significant effect of visitor place satisfaction on proenvironmental behavioral intentions, (c) a significant and positive influence of proenvironmental behavioral intention on place attachment (place identity, place dependence, place social bonding, place affect), and (d) a significant and negative effect of visitor place satisfaction on place social bonding. The main finding relates to the promotion of proenvironmental behaviors among national park users that—in addition to individual benefits—provides environmental sustainability as well as practical benefits for park managers and society.

Key words: Measure invariance; Proenvironmental behavior; Visitor satisfaction; Place attachment; National parks

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Introduction

Proenvironmental behavior as a tool for enhancing sustainability of tourist attractions has attracted significant interest recently (e.g., Larson, Stedman, Cooper, & Decker, 2015; Zhang, Zhang, Zhang, & Cheng, 2014). Although several studies made significant contributions to the literature, the environmental problems threatening national parks demand a more thorough investigation of human attitudes and behavior. National parks are protected areas conserving natural and cultural assets (Randle & Hoye, 2016; Suntikul & Jachna, 2016). For the sophisticated visitor in search of distinctive natural scenery and cultural assets, these natural settings often hold special meanings and, as such, facilitate social and psychological interactions between people and settings (Snepenger, Snepenger, Dalbey, & Wessol, 2007). These interactions often result in high levels of place satisfaction (Ramkissoon & Mavondo, 2015) and become visitors' favorite places. Recognizing the physical, psychological, and social benefits arising from visiting national parks, visitors endow these settings with value (Kyle, Graefe, & Manning, 2005) and may become both emotionally and physically attached to these environments. This person–place bond is commonly referred to as *place attachment* in the environmental psychology literature (Ramkissoon, 2015).

National parks are growing in popularity, with increasing visitation resulting in higher demand for visitor facilities. This has put severe pressure on environmental resources, with park managers constantly being challenged to maintain the biodiversity of parks, cultural resources, and park infrastructure (Ma, Ryan, & Bao, 2009; Xu & Fox, 2014). Fostering proenvironmental behavior among national park visitors is suggested as a long-term strategy that park managers could apply to decrease behaviors that are detrimental to the natural environment (Lehman & Geller, 2004) and to stimulate environmentally responsible actions by park visitors (Larson et al., 2015; van Riper & Kyle, 2014). *Proenvironmental behavior* is defined as an action by an individual or group that promotes or results in the sustainable use of natural resources (Sivek & Hungerford, 1990). Behavioral scientists have argued that conservation of national parks' resources is likely to happen by influencing visitor behavior (Blackstock, White, McCrum, Scott, & Hunter, 2008).

Applying the principles of behavior analysis, researchers have demonstrated significant associations between visitors' place attachment (e.g., Yuksel, Yuksel, & Bilim, 2010), proenvironmental behaviors (e.g., Cheng & Wu, 2015), and place satisfaction (e.g., Ramkissoon, Smith, & Kneebone, 2014) in nature-based settings. Results indicate that place protective behaviors, such as a sense of commitment and personal responsibility at parks, increase as an individual gets more positively attached to a place (Walker & Ryan, 2008). A few other studies have found place satisfaction as an important antecedent to proenvironmental behaviors and place attachment (e.g., Stedman, 2002; Uzzell, Pol, & Badenas, 2002).

Recognizing the lack of conclusive findings on this important topic of investigation, Ramkissoon and Mavondo (2015) proposed an alternative model with proenvironmental behavior as a key mediator between visitor place satisfaction and place attachment, suggesting that visitor satisfaction may lead to high levels of place attachment (place identity, place dependence, place social bonding, place affect). For instance, national park visitors form social bonds through collective participation in park specific proenvironmental behaviors (Hartmann & Apaolaza-Ibánez, 2012). Researchers have argued that engaging in environmentally responsible behaviors contributes to one's sense of well-being (Cho, Thyroff, Rapert, Park, & Lee, 2013) and place affect, enhances one's place identity through protection of distinctive features, and promotes an individual's place dependence on the environmental settings of a place (Ramkissoon, Smith, & Weiler, 2013).

In this present study, we argue that proenvironmental behavior leads to park sustainability. Sustainability is enhanced by preservation of biodiversity through diligent nurturing and utilization of park resources. This involves engaging park users in active participation for the welfare of the park's biodiversity—that is, the greater visitors' proenvironmental behavior, the more sustainable the national park. To achieve these objectives, park managers and staff need to have a commitment

to promoting proenvironmental behaviors and to soliciting support and active participation of visitors. One potential strategy is to create visitor place satisfaction. Satisfied visitors are likely to be committed to preservation and enhancement of the national park in addition to other benefits such as positive word-of-mouth and a willingness to revisit. These activities further contribute to environmental, economic, and social sustainability (Nunkoo & Ramkissoon, 2016).

With the resurgence of interest from both researchers and practitioners across the globe in supporting behavior change initiatives to safeguard environmental resources for present and future generations, valid and reliable measures are needed to test for potential generalizability of findings across contexts. Researchers are cautioned that measurement invariance needs to be empirically tested and not be taken for granted (Adcock & Collier, 2001; King, Murray, Salomon, & Tandon, 2004). A key requirement is that the measurement characteristics of constructs under investigation are invariant across contexts. Findings from comparing different samples can only be meaningfully interpreted when measure equivalence is first established (Billiet, 2003; Davidov, 2009).

The first aim of this study is to systematically test measurement invariance of the constructs of place satisfaction, proenvironmental behavioral intentions, and place attachment in an Australian and a Canadian sample following best practice. Once measure equivalence is established, the second aim is to empirically test Ramkissoon and Mavondo's (2015) proposed conceptual model (see Fig. 1) to allow for valid comparisons across qualitatively distinctive populations using data collected from visitors to the Dandenong Ranges National Park (DRNP) in Australia and the Bruce Peninsula National Park (BPNP) in Canada. The study begins by rigorously establishing measure equivalence between the Australian and Canadian samples before testing the hypothesized relationships among the theoretical constructs of interest in this research. The study concludes with important practical implications for park managers. It is hoped that the findings provide a better understanding of the associations between visitors' place satisfaction, proenvironmental behavioral intentions, and place attachment (place social bonding, place affect, place identity, place dependence) in different countries. This permits investigation of the generalizability of the scales and the findings across different contexts.

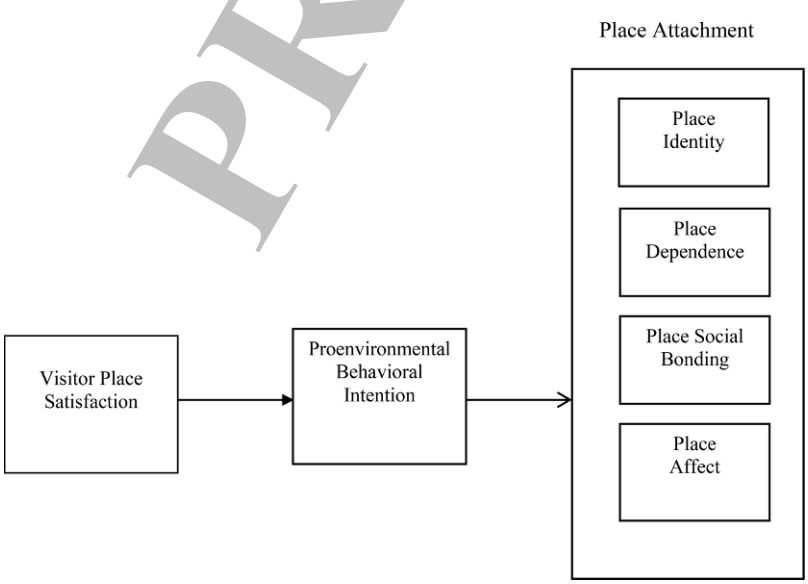

Figure 1. Proposed framework.

Theoretical Background

Visitor Place Satisfaction and Proenvironmental Behavior

Visitor place satisfaction is significant in understanding visitors' psychology of place. It is the perceived quality of the settings to meet the visitor's needs for physical attributes and services. Evidence suggests that people experience feelings of gratification when satisfied with a place (e.g., Tudoran, Olsen, & Dopico, 2012). For example, a river in a national park may give rise to a sense of harmony among visitors and the natural environment (Breiby, 2015). Increased emphasis on such aspects is paramount to successful park management (Tonge, Moore, & Taplin, 2011). Several studies have focused on how satisfying experiences predict future intentions (e.g., Lee, Kyle, & Scott, 2012; McMullan & O'Neill, 2010). Empirical studies also suggest that place-related concepts such as place satisfaction may lead to place protective behaviors in nature-based settings (e.g., Ramkissoon et al., 2013). The latter might involve conservation actions such as volunteering in projects to protect a national park's resources (van Riper & Kyle, 2014).

Halpenny's (2010) study revealed that satisfaction with Point Pelee National Park in Canada did not influence visitors' proenvironmental behavioral intentions. On the other hand, Ramkissoon and Mavondo (2015) found a positive relationship between visitor satisfaction and proenvironmental behavioral intentions in an Australian national park. Thus, investigations on the link between visitor satisfaction and positive environmental behaviors are still ambiguous and somewhat contradictory. The above review advocates a need for further investigation on the association between the two constructs, which has important implications for park sustainability. The following hypothesis is proposed:

Hypothesis 1: Visitors' place satisfaction is positively related to park visitors' proenvironmental behavioral intentions.

The Relationship Between Proenvironmental Behavior and Place Attachment

Literature suggests place attachment as an antecedent of proenvironmental behavior (e.g., Cheng, Wu, & Huang, 2013). More recent studies have attempted to investigate the mediating effect of proenvironmental behavior on the relationship between visitor satisfaction and place attachment with the following subdimensions: place dependence, place identity, place affect, and place social bonding (e.g., Ramkissoon & Mavondo, 2015). Although several studies have contributed to the association between place attachment and proenvironmental behavior, this investigation demands further research in different settings and countries to expand on existing findings. The following subsections review literature on the association between proenvironmental behavior and each of the subdimensions of place attachment (place identity, place dependence, place social bonding, and place affect).

Proenvironmental Behavior and Place Identity

Meanings associated with places are frequently related to one's sense of place identity. Often the flora and fauna of a national park remind people of one's sense of connectedness with nature. People have positive experiences, such as relaxation, that could lead to positive environmental behaviors (Walker & Ryan, 2008) to protect and promote shared place-related identities (Devine-Wright, 2009). Place identity also builds on the notion that people are reminded of the communities they come from, parks' resources they used to enjoy and protect (Main, 2013), and, hence, the urge to protect the physical and symbolic attributes of a place. Theoretically, the link between place identity and proenvironmental behavior builds on the notion that people identify strongly with places that mean a lot to them. Applied to a national park context, visitors' engagement in behaviors to protect the park's distinctive features may foster higher levels of place identity.

Proenvironmental Behavior and Place Dependence

Place dependence is characterized by the positive evaluation of a place to provide amenities necessary to meet an individual's needs (Stokols & Shumacker, 1981; Williams, Patterson, Roggenbuck, & Watson, 1992). Place dependence is likely to arise when an individual judges that the current place is better than alternatives and the unwillingness to

change the place for another (Anton & Lawrence, 2014). The literature has provided evidence that recreationists get satisfied with nature-based settings that help them achieve desired goals and, as such, are unwilling to choose alternative settings for activities (Tsaur, Liang, & Wang, 2014). Research suggests that visitor place satisfaction predicts place dependence (e.g., Ramkissoon et al., 2014). More recent studies (e.g., Ramkissoon & Mavondo, 2015) established that one of the principal mechanisms linking place satisfaction to place dependence is proenvironmental behavior, suggesting that park visitors who are more environmentally responsible tend to engage in park-specific proenvironmental behaviors, thus enhancing visitors' place satisfaction, with higher levels of place dependence. This supports the premise that visitors with higher levels of proenvironmental behavior may report higher levels of place dependence in a national park setting.

Proenvironmental Behavior and Social Bonding

An extant review of place attachment has enhanced the understanding of the role of place in forming social bonds (e.g., Main, 2013). *Place social bonding* in the tourism context refers to communal bonds through people–place interactions in tourism settings (Nye & Hargreaves, 2009; Oluyinka, 2011). Place meanings are conveyed through shared values, beliefs, and behaviors by the collective groups that individuals intimately associate with (Stedman, 2008). Research demonstrates that people use social aspects of place to develop stronger proenvironmental behaviors (e.g., Cho et al., 2013). Parks serve as a social place (Main, 2013), often resulting in park users' commitment to work collectively to protect the resources (Husted, Russo, Meza, & Tilleman, 2014). These findings reinforce the premise that visitors' proenvironmental behavior in a national park setting may lead to higher levels of place social bonding in such settings (Ramkissoon & Mavondo, 2015).

Proenvironmental Behavior and Place Affect

Drawing on literature from environmental psychology, place affect has gained significance in tourism. Consumers of a place tend to assign more value to a place that brings benefits (Suntikul & Jachna, 2016). Emotions play an important role in outdoor recreation settings contributing to visitors' psychological well-being (Korpela, Ylen, Tyrvainen, & Silvennoinen, 2008). Research has shown positive significant relationships between visitors' high levels of place affect and nature protective behaviors (Halpenny, 2010). The recent concentration on place affect and place protective behaviors needs to be expanded to how engagement in the protection of a national park's resources could lead to high levels of place affect.

From an extant review of literature, it can be predicted that proenvironmental behavior is positively related to place attachment:

Hypothesis 2: Proenvironmental behavior is positively related to (a) place identity, (b) place dependence, (c) place social bonding, and (d) place affect.

In addition to Hypotheses 1 and 2, Hypothesis 3 is proposed to test the effect of visitors' place satisfaction on place social bonding. Although place social bonding has been found to be a significant predictor of visitors' place satisfaction (e.g., Ramkissoon et al., 2013), studies investigating the reverse relationship between these two constructs—that is, the effect of visitors' place satisfaction on place social bonding—are scarce in the literature, with the exception of a few (e.g., Ramkissoon & Mavondo, 2015). Given the growing importance paid to social ties formed from social interactions in nature-based settings, testing the relationship between visitor place satisfaction and place social bonding in a national park context addresses an important gap in literature. The following hypothesis is proposed:

Hypothesis 3: Visitor place satisfaction is positively related to place social bonding.

Method

Study Context, Sample, and Data Collection

To test the cross-country robustness of the association between place satisfaction, proenvironmental behavior, and place attachment, data were collected from repeat visitors to the Dandenong Ranges National Park (DRNP), located in Victoria,

Australia, and the Bruce Peninsula National Park (BPNP) in Ontario, Canada. DRNP (see Fig. 2) and BPNP (see Fig. 3) both are located in large countries and near large metropolis. Both parks have diverse ecosystems and attract thousands of visitors every year. Managed by Parks Victoria and Parks Canada, respectively, the two park authorities have a memorandum of understanding (Parks Canada, 2010; Parks Victoria, 2007), striving to achieve a balance between visitation and conservation of the parks' biodiversity. The memorandum of understanding emphasizes the point that the parks see themselves as pursing the same objectives, face similar challenges, and look at each other for mutually enriching experiences. A comparative park study will assist researchers and park managers in assessing the relative merits of approaches to date to foster visitor place satisfaction, proenvironmental behavior, and place attachment.

Of central importance to the choice of sites are the geographical factors—for example, proximity to large cities such as Melbourne and Toronto; comparability of natural and cultural assets; the wildlife; geological features; historic and cultural sites; park infrastructure (e.g., parking, toilet facilities); and the range of recreational outdoor activities, such as bushwalking, camping, bird watching, hiking, photography, nature study, and barbecue picnics. Both national parks attract volunteers for the protection of the parks' rich biodiversity. English is the official and most spoken language in both Australia and Canada. However, French is the

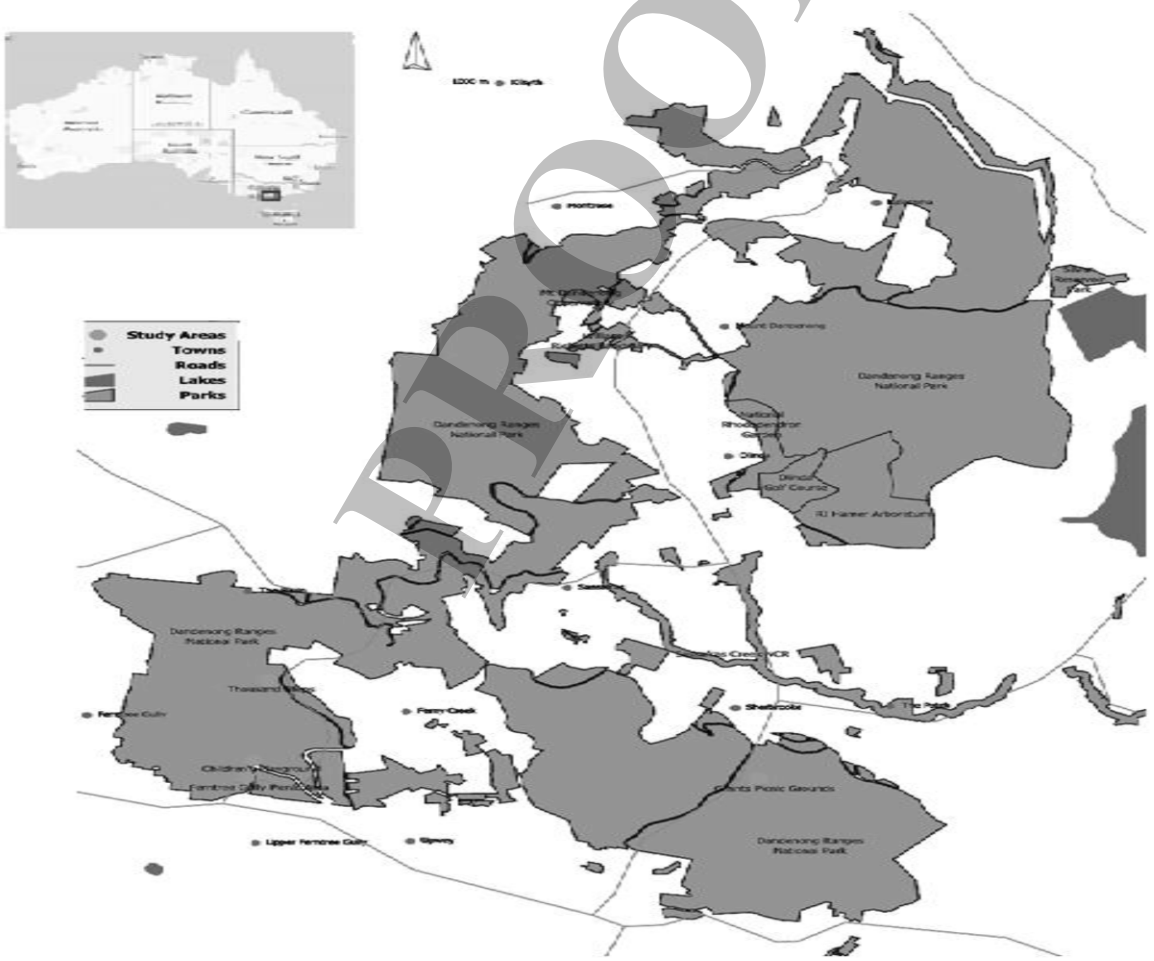

Figure 2. Dandenong Ranges National Park.

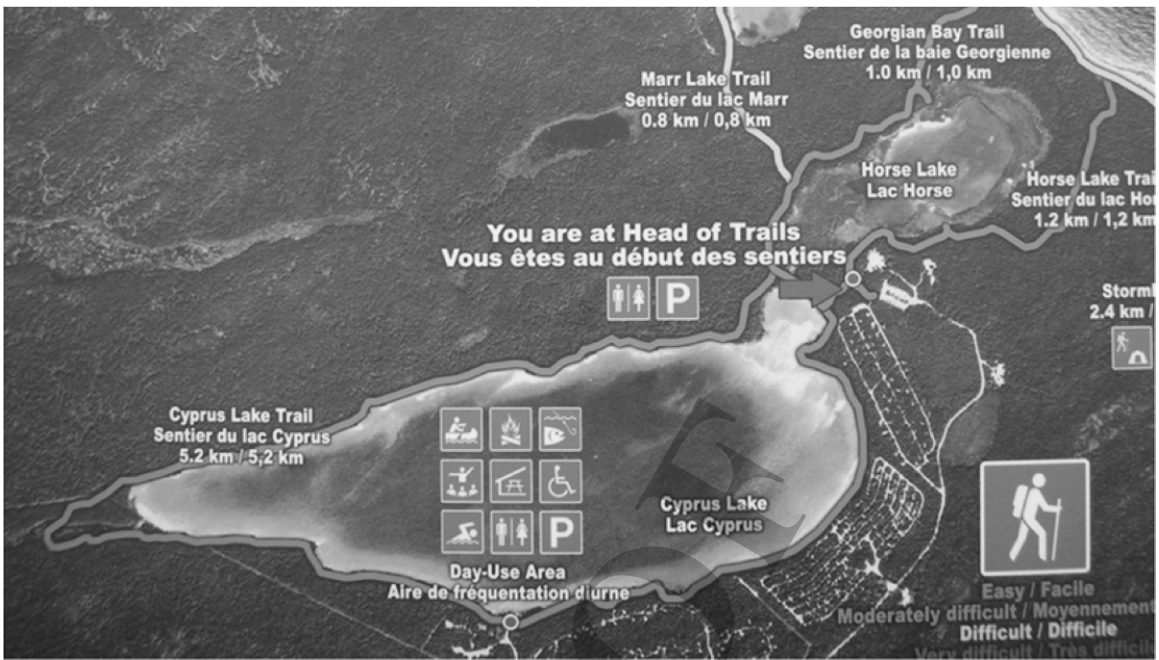

Figure 3. Bruce Peninsula National Park.

second official language of Canada. Because of the dominance of English at the two national parks, it was felt there was no need to translate the questionnaire, which would have created an additional layer of complexity (language equivalence).

Data were collected in the same year, between June and September in Australia, and between September and December in Canada, at five comparable spots in both national parks, identified by Parks Victoria and Parks Canada as high-use sites. Although comparable, the two national parks are not identical. Australia is an island nation with strict controls on foreign biomaterial that could threaten its biodiversity. The potential visitors to the two parks could be different in responding to the various questions shaped by composition, historical circumstances, and the potential of some visitors who have French as the first language of choice.

Participation was sought from visitors who were 18 years of age or older and from locals and nonlocals, intrastate and interstate visitors, individuals, and head of families. Participants were selected systematically so that every third visitor was approached. Only when there was refusal or inability to participate was the next visitor approached, and then the systematic sampling continued. Participants were intercepted at corresponding sites for both national parks. These had been identified by park management as the most frequently patronized places. The data used to analyze measure equivalence and to test the hypotheses were from repeat visitors. This was considered more consistent with the dimensions of place attachment. It is argued that repeat visitors can develop higher levels of place attachment (place identity, place dependence, place social bonding, and place affect) than first-time visitors. The above reasons make DRNP and BPNP ideal for examining the association between place satisfaction, proenvironmental behavior, and place attachment. A total sample of 339 (Australian) and 296 (Canadian) repeat visitors were used for further analysis. Three items were used for the place satisfaction construct (1 = *strongly disagree*, 5 = *strongly agree*). Three items measured proenvironmental behavioral intentions (1 = *very unlikely*, 5 = *very likely*), and 10 items measured place attachment (1 = *strongly disagree*, 5 = *strongly agree*). All measurement items were adopted from well-established scales in the literature (e.g., Halpenny, 2010; Ramkissoon et al., 2013; Yuksel et al., 2010).

Measurement Invariance

Measurement invariance allows researchers to determine whether a testing instrument is appropriate for use in qualitatively distinct groups. It refers to "whether or not, under different conditions of observing and studying phenomena, measurement operations yield measures of the same attribute" (Horn & McArdle, 1992, p. 117). Measure invariance is receiving increasing attention in tourism (e.g., Chi, 2010; Han, Hsu, & Sheu, 2010) and could help researchers establish whether a test measures the same trait dimension in the same way when applied to two or more groups, whether test scores for different groups are comparable using the same measurement scale (Drasgow, 1987), and, finally, whether differences observed across groups on the same measurement scale are meaningfully interpretable (Mavondo & Farrell, 2000).

Results and Discussion

Profile of the Two Samples

Table 1 shows the demographic profile of visitors at the Dandenong Ranges and Bruce Peninsula national parks. Results from both samples showed that most visitors were between 25 and 34 years of age and had completed a university degree. In addition, most visitors were women in Australia (54%) and were men (53%) in Canada.

Table 1
Repeat Visitor Profiles

Characteristic	Australia ($n = 339$)	Canada ($n = 296$)
Gender		
Male	46%	53%
Female	54%	47%
Age group (years)		
18–24	19%	23%
25–34	29%	44%
35–44	21%	17%
45–54	18%	6%
55–64	12%	6%
≥65	1%	3%
Education level completed		
Primary	1%	6%
Secondary	25%	40%
University	69%	48%
Vocational	5%	6%
Visitation		
Twice	14%	47%
3–4 times	24%	36%
≥5 times	62%	17%

Model Comparisons Between Australia and Canada

The measurement model was developed for each country in the first instance. Acceptable fit measures were obtained for both Australia and Canada. The correlation table for both Australia and Canada is provided in Table 2. The next step was to perform multiple group analysis with AMOS Version 22 software.

Model 1 (configural model) does not place any equality constraints on the measurement model. It measures the hypothesis that the same latent variables are mapped in the two samples and that the items mapped by each latent variable are correspondingly the same. The results in Table 3 for Model 1 show that this is supported ($\chi^2/df = 2.18$, normative fit index [NFI] = 0.940, Tucker–Lewis index [TLI] = 0.954, comparative fit index [CFI] = 0.960, root-mean-square error of approximation [RMSEA] = 0.038).

The next step was to place constraints on the regressions of the latent variables to respective items. This tests the weak equivalence—that is, the equality of the loading factors. The relevant test is the chi-square difference between Model 1 and Model 2. The results show that placing these constraints did not lead to significant worsening of the model because $\Delta\chi^2/\Delta df = 1.72$, $p > 0.05$. Thus, equality of factor loadings is supported. The next step was to place equality constraints on the intercepts of the items across the two samples. This is referred to as testing for strong factorial equivalence (Model 3). This step is critical because support for this model establishes acceptable equivalence to undertake any other comparisons (Mavondo & Farrell, 2000). Once this is supported, the remaining tests—whether supported or not—just provide additional information but do not negate the equivalence of the measures in the two samples. The substantive test is comparing Model 2 against Model 3. The chi-square difference was $\Delta\chi^2/\Delta df = 1.38$, $p > 0.10$. Thus, strong factorial equivalence is strongly supported.

Table 2
Correlations, Reliability, and Square Roots of AVE

Variable	Visitor Satisfaction	PEB	Place Identity	Place Dependence	Place Affect	Place Social Bonding
Visitor satisfaction	**0.77**	0.55	0.49	0.44	0.48	−0.13
PEB	0.43	**0.60**	0.38	0.36	0.43	0.03
Place identity	0.51	0.39	**0.88**	0.56	0.91	0.34
Place dependence	0.45	0.34	0.50	**0.81**	0.50	0.12
Place affect	0.52	0.42	0.91	0.47	**0.85**	0.34
Place social bonding	−0.03	0.03	0.39	0.13	0.38	**0.77**
Cronbach's alpha						
Australia	0.83	0.86	0.86	0.75	0.89	0.75
Canada	0.79	0.86	0.85	0.77	0.88	0.74
Internal consistency						
Australia	0.80	0.87	0.86	0.76	0.89	0.77
Canada	0.81	0.80	0.85	0.78	0.89	0.74

Note. Bold values on the diagonal are square roots of the average variance extracted (AVE; from Model 5 in Table 3). Values below the diagonal are correlations for Australia ($n = 339$); values above the diagonal are correlations for Canada ($n = 296$). PEB, proenvironmental behavior.

The following step was to test for the equivalence of error terms of the measured items. The results in Table 3 show that this is not supported because comparing Model 4 against Model 3 was $\Delta\chi^2/\Delta df = 9.63$, $p < 0.001$. This showed that there are significant differences in the measurement errors between the Australian and Canadian samples. Because this was not supported, all subsequent analyses are based on Model 3. Model 5, also called the elegant equivalence model, involves placing constraints on the covariances among the latent factors. The test for this is comparing Model 5 against Model 3. The results indicate that this is supported because $\Delta\chi^2/\Delta df = 0.72$, $p > 0.99$. Thus, the covariances are correspondingly equivalent across the Australian and Canadian samples.

The final and critical step is to compare the means of the latent factors (Model 6). In modeling the test, the means for the Australian sample were fixed to zero, and the means for the Canadian sample are estimated relative to the Australian means. The chi-square difference between Model 6 and Model 5 is

Table 3
Measure Equivalence Testing for Australia ($n = 339$) and Canada ($n = 296$)

Model (M)	χ^2 (*df*)	χ^2/df	$\Delta\chi^2/\Delta df$	*p*	NFI	TLI	CFI	RMSEA
Configural equivalence (M1)	388.57 (178)	2.18		<0.001	0.940	0.954	0.966	0.038
Weak equivalence (M2)	405.74 (188)	2.16		<0.001	0.936	0.958	0.964	0.038
M2 − M1	17.17 (10)		1.72	>0.05				
Strong equivalence (M3)	427.76 (204)	2.10		<0.001	0.930	0.953	0.960	0.039
M3 − M2	22.02 (16)		1.38	>0.10				
Equivalence of variances (M4)	581.74 (220)	2.64			0.910	0.937	0.942	0.045
M4 − M3	154 (16)		9.63	<0.001				
Elegant equivalence (M5)	437.81 (218)	2.00		<0.001	0.927	0.948	0.957	0.039
M5 − M3	10.05 (14)		0.72	>0.99				
Equivalence of means (M6)	411.22 (212)	2.00		<0.001	0.938	0.966	0.970	0.035
M6 − M5	26.59 (6)		4.43	<0.001				
SEM (M7)	564.86 (194)	2.91			0.913	0.926	0.940	0.049
SEM equivalent of regressions (M8)	569.12 (200)	2.85			0.912	0.929	0.941	0.048
M8 − M7	4.26 (6)		0.71	>0.99				

Note. NFI, normative fit index; TLI, Tucker–Lewis index; CFI, comparative fit index; RMSEA, root-mean-square error of approximation; SEM, structural equation model.

$\Delta\chi^2/\Delta df = 4.43$, $p < 0.001$. This indicates that there are significant differences in the means of the latent variables across the two samples. The results in Table 4 identify where the significant differences exist. The means of the latent factors are higher in Canada for visitor satisfaction ($p < 0.025$), pro-environmental behavior ($p < 0.001$), place identity ($p < 0.001$), place dependence ($p < 0.01$), and place affect ($p < 0.01$). There is no statistically significant difference for place social bonding. The testing for the differences of means of the latent factors is equivalent to the traditional *t* test of the composite measures. The *t* test is often misused by performing the test before establishing measure equivalence. The proposed approach establishes best practice in performing mean differences.

Table 5 reports the results of testing the hypotheses in the conceptual model (see Fig. 4). Model 7 tests the equivalence of the relationships among the latent factors. No constraints were placed on Model 7 because this is the baseline model. The model statistics were as follows: $\chi^2/df = 2.91$, NFI = 0.913, TLI = 0.926, CFI = 0.940; RMSEA = 0.049. This shows that the model fits the data well.

In Model 8, all the relationships among the latent factors were constrained to equality. Model 8 is compared to Model 7, and the chi-square difference is estimated at $\Delta\chi^2/\Delta df = 0.71$, $p > 0.99$. This supports the hypothesis that all the regressions for hypothesis testing are equivalent. This leads to the conclusion that whatever hypothesis is supported or disconfirmed in Australia, the same holds for Canada. Hence, only one table is produced to test the hypotheses in the conceptual model.

Visitor place satisfaction was found to positively influence visitors' proenvironmental behavioral intentions, supporting H1 ($\beta = 0.558$, $t = 4.898$, $p < 0.001$). This suggests that satisfied visitors are likely to engage in environmentally responsible behaviors onsite to protect the park's resources. This finding is consistent with other studies (e.g., Lopez-Mosquera & Sanchez, 2011; Ramkissoon & Mavondo, 2015).

Findings of this study further suggest that visitors' proenvironmental behavioral intention has a strong direct association with place attachment. H2 tests the effect of proenvironmental behavioral intention on place identity, place dependence, place social bonding, and place affect. Visitors' pro-environmental behavioral intentions were found to positively influence place identity (H2a; $\beta = 0.962$, $t = 5.282$, $p < 0.001$), place dependence (H2b; $\beta = 0.556$, $t = 4.992$, $p < 0.001$), place social bonding (H2c; $\beta = 0.639$, $t = 4.738$, $p < 0.001$), and place affect (H2d; $\beta = 0.942$, $t = 5.327$, $p < 0.001$). These findings are consistent with studies showing that people are willing to strongly support places tied with self-identity (Stedman, 2002), social bonding, dependence, and affect (Ramkissoon & Mavondo, 2015) and may further highlight the significant role of proenvironmental behavior in place research.

Hypothesis 3 tests the direct relationship between visitors' place satisfaction and place social bonding. Interestingly, the results suggest a negative and significant influence of visitor place satisfaction on place social bonding ($\beta = -0.442$, $t = -6.882$, $p < 0.001$). This suggests that visitors do not necessarily view parks as ideal places for social bonding because there are many other settings that facilitate social bonding. This further suggests that the main reason for visiting the park is personal reflection and closeness to nature. However, when the relationship

Table 4
Means for Canada ($n = 296$) When Australian Means Are Constrained to Zero ($n = 339$)

Variable	Estimate	*SE*	*t*	*p*
Satisfaction	0.083	0.032	2.25	0.025
Proenvironmental behavior	0.256	0.063	4.04	0.001
Place identity	0.212	0.054	3.94	0.001
Place dependence	0.149	0.058	2.58	0.01
Place affect	0.200	0.064	3.15	0.01
Place social bonding	0.029	0.065	0.46	0.645 (*ns*)

Table 5
Hypotheses Testing for Both Australian ($n = 339$) and Canadian ($n = 296$) Samples

Hypothesis (H)	Standardized Regression Estimate	t	p
H1: Visitor satisfaction is related to PEB	0.56	4.89	<0.001
H2a: PEB is related to place identity	0.96	5.28	<0.001
H2b: PEB is related to place dependence	0.56	4.99	<0.001
H2c: PEB is related to place social bonding	0.64	4.74	<0.001
H2d: PEB is related to place affect	0.94	5.33	<0.001
H3: Visitor satisfaction is related to place social bonding	−0.44	−6.88	<0.001

Note. PEB, proenvironmental behavior.

is mediated by proenvironmental behavior, it is positive and significant. This finding is consistent with Ramkissoon and Mavondo (2015), suggesting that proenvironmental behavior could play a critical role in linking visitors' place satisfaction to levels of place social bonding. Despite the direct effect between place satisfaction and place social bonding being negative, proenvironmental behavior could lead to a positive indirect effect between the two constructs. This finding can add to the extant literature, reconciling the premise that satisfaction with a place might lead to a strong sense of place social bonding (Jiang, Ramkissoon, & Mavondo, 2016) through visitors'engagement in proenvironmental actions to enhance park biodiversity.

Implications and Conclusion

The present study makes a contribution in validating a previous model developed by Ramkissoon and Mavondo (2015). The findings of this study extend to qualitatively different populations (countries). It compares the associations between visitors' place satisfaction, proenvironmental behavior, and place attachment, and it demonstrates equivalence and potential generalizability across different

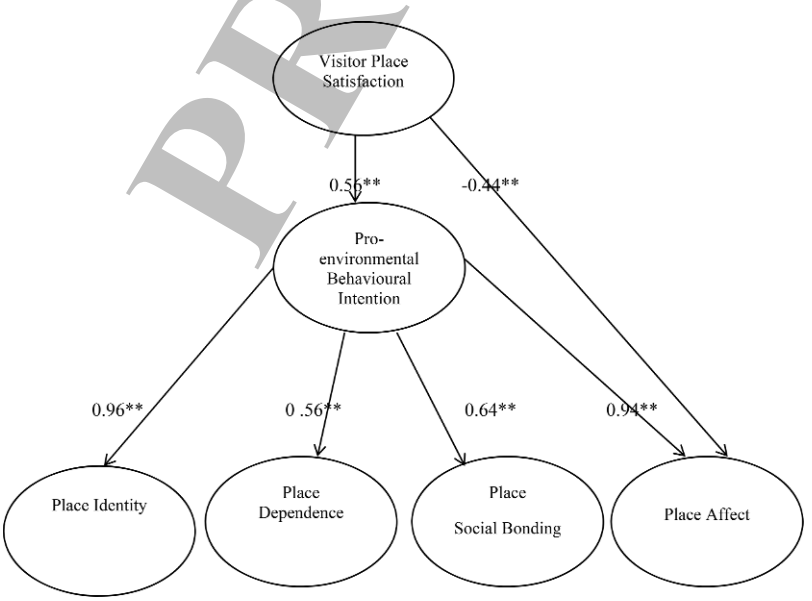

Figure 4. Structural model with standardized regression coefficients. $^{**}p < 0.001$.

populations by using two distinctive national parks in Australia and Canada as examples. Findings support the robustness of the prior model and allows for the results to be generalizable. Researchers are invited to further this topic of investigation across cultures, countries, and other distinctively different nature-based tourist settings. It will be interesting to see whether measurement invariance is achieved. Where differences are noted, researchers could benefit from further insights in establishing why differences were noted. This will assist park managers and policy advocates in contributing toward sustainable development goals.

The present study further has important implications for park managers of DRNP (Australia) and BPNP (Canada) in, first, delivering customer satisfaction and, second, enhancing visitors' park-specific proenvironmental behaviors, which are foundational to generating place attachment. Because this study's samples represent repeat visitors, one can explain the causal relationships in the model. Satisfied customers of national parks develop proenvironmental behavior in addition to other benefits, such as willingness to provide positive word-of-mouth and revisitation. Repeat visitors are more willing to participate (volunteering; Gifillan, 2015) in activities that preserve and enhance the biodiversity of the park. This supports our argument that proenvironmental behavior is closely associated with environmental sustainability. Park managers could emphasize activities based on volunteering. Thus, efforts to build proenvironmental behavior could serve as a medium for long-term investment with individual, social, and environmental benefits.

Park managers can proactively promote responsible consumption of the parks' biodiversity to maintain a balance between visitation and protection of parks' resources. In addition to sensitizing visitors on negative visitor impacts such as littering, overcrowding, and feeding of animals, park managers could apply social strategies (Restall & Conrad, 2015) to promote proenvironmental behavior through systematic social learning, encouraging deliberation and dialogue between visitors. This requires building trust (Reed, Godmaire, Abernethy, & Guertin, 2014) among park visitors and park management, which allows knowledge sharing and transfer among those with shared interests on sustainability challenges faced by national parks.

Collective learning could further facilitate the adoption of park-specific proenvironmental behaviors and promote park sustainability. This sharing of knowledge may help park visitors understand the current issues faced by park management and encourage good practices. As argued by Wildermeersch (2007), there is great value in collective or social learning that could lead to active participation in managing parks' biodiversity and resources. Changes in practices by park visitors such as engaging in proenvironmental actions—for example, removal of weeds—would produce desired outcomes. Collective learning might further help in reducing undesired behaviors, such as to stop visiting a favorite spot in the national park to help it recover from environmental damage. Encouraging desired behaviors and discouraging undesired behaviors, commonly known as *site hardening* (Baldwin, Cave, & Lodge, 2011), is a visitor behavior management technique often applied in national park management. Hence, through collective learning, visitors would be assisting park managers in site hardening and would help promote park sustainability as well as contribute to the societal goals at large.

Another important strategy that could be implemented by park managers is zoning (e.g., Buckley, 2011), where visitor numbers, length of visit, and activities can be controlled. This allows park management to encourage proenvironmental behaviors, such as reducing the time spent in one's favorite part of the park. There is also benefit for park managers to use participatory approaches to involve park visitors from the local community in decision making (Shava & Hubacek, 2011). This may boost the level of local support, resulting in implementation of effective and meaningful behavior change policies—one of the greatest challenges that park managers face in the pursuit of park sustainability.

Furthermore, this study corroborates previous study findings showing the association between proenvironmental behavior and the emotional connection that individuals share with a place's settings. Future research would benefit from more explanatory studies in promoting visitors' levels of place attachment through engagement in

proenvironmental activities in national park settings. Researchers could delve further into how proenvironmental behavior could enhance affective and social ties in nature-based settings. Enhancing park-specific proenvironmental behaviors would have important benefits, strengthening the emotional bond that national park users share with such settings. Adopting proenvironmental behaviors leads to sustainable benefits for the society at large through education and societal enjoyment, promoting the general well-being and welfare of people.

Despite these contributions, limitations lie in Australia being an island with strict biological controls on plant and animal movement. Because Canada is part of the North American continent, there may be differences in the use of words and phrases in Canada and Australia due to geographical separation. Owing to the importance stressed by park managers on park sustainability, future research should aim at more cross-country comparative studies and longitudinal studies extending the findings of the current study.

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