Connecting protected area visitor experiences, wellness motivations, and soundscape perceptions in Chilean Patagonia

Andrea Ednie, Trace Gale, Karen Beeftink & Andrés Adiego

To cite this article: Andrea Ednie, Trace Gale, Karen Beeftink & Andrés Adiego (2020): Connecting protected area visitor experiences, wellness motivations, and soundscape perceptions in Chilean Patagonia, Journal of Leisure Research, DOI: 10.1080/00222216.2020.1814177

To link to this article: https://doi.org/10.1080/00222216.2020.1814177

Published online: 24 Sep 2020.
Connecting protected area visitor experiences, wellness motivations, and soundscape perceptions in Chilean Patagonia

Andrea Ednie\textsuperscript{a}, Trace Gale\textsuperscript{b}, Karen Beeftink\textsuperscript{c}, and Andrés Adiego\textsuperscript{b}

\textsuperscript{a}Human Performance and Recreation, University of Wisconsin-Whitewater; \textsuperscript{b}Sustainable Tourism Studies, Center for Investigation in Ecosystems of Patagonia (CIEP); \textsuperscript{c}Professional Studies, University of Maine at Machias

ABSTRACT
Supporting worldwide Healthy Parks, Healthy People (HPHP) research expansion, this study investigated how wellness motivations interplay with auditory experiences by examining relationships between protected area visitors’ wellness motivations, and their perceptions of particular sounds and overall soundscape appeal. Visitor surveys ($N=899$), implemented in the Coyhaique National Reserve in Chilean Patagonia, included participant demographics, wellness motivations, a listening exercise, and overall soundscape ratings. Wellness motivations were reduced into emotional, intellectual, physical, sensory, and social dimensions. All dimensions were significantly correlated with participants’ ratings of the soundscape’s appeal and their desire to visit more (based on the soundscape). Cluster analysis grouped participants into low, moderate, and high wellness motives groups. Groups with high-wellness motives were found to rate specific natural sounds and the overall soundscape higher than groups with lower wellness motives. This study suggests incorporating visitors’ wellness motivations into soundscape and other perception-based research may assist with HPHP objectives.

KEYWORDS
Protected areas; Healthy Parks, Healthy People (HPHP); visitor wellness motivations; soundscape; natural sounds

As research to support and inform wellness initiatives has advanced, a growing number of studies have identified a relationship between health and wellness benefits, and time in nature, access to natural areas, and nature-based leisure and recreation (Lemieux & Doherty, 2016; Newton, 2007; Puhakka et al., 2017; Taff et al., 2019; Thomsen et al., 2018; Townsend & Henderson-Wilson, 2016; UK Sustainable Development Commission, 2008). Hurly and Walker (2019) even proposed that “nature relatedness should be considered a basic psychological need” (p. 303). Their proposal supports other researchers’ assertions that nature provides important ecosystem services (Bratman et al., 2012, 2015), and that these services are an important justification for nature conservation (Francis et al., 2017).

CONTACT Andrea Ednie edniea@uww.edu

© 2020 National Recreation and Park Association
The global Healthy Parks, Healthy People (HPHP) movement has provided an important link between the health and wellness disciplines and protected area (PA) managers. HPHP partners have collaborated around the world, connecting research and programming resources for nature-based recreation in the interest of public and community health (Bricker, Brownlee, et al., 2016; Brownlee et al., 2016; Taff et al., 2019; Townsend et al., 2015). The HPHP concept demonstrates the interrelationship between two strains; the first focuses on how nature and parks can strengthen human health and the second focuses on how stronger connections with nature facilitate efforts to maintain the health of ecosystems, resulting in healthier parks (United States National Park Service, 2018).

Thus, a significant HPHP research focus seeks to understand the meaning of being a healthy human and the impacts of nature deprivation (Townsend et al., 2015). HPHP collaborations have advanced “conceptual and empirical research on the health benefits of parks, greenways, and other protected areas” (Bricker, Brownlee, et al., 2016, p. 2). Also, recent research demonstrates growing support about the positive impacts of nature experiences on mental health and emotional well-being (Bratman et al., 2015; Larson et al., 2016). HPHP research also examines relationships between healthier habits related to time in nature and a greater connection with nature and parks (Townsend & Henderson-Wilson, 2016).

Nevertheless, many researchers have identified important knowledge gaps that limit managers’ ability to develop appropriate goals, management plans, and visitor programs related to health and wellness (e.g., Lemieux et al., 2012, 2016; Puhakka et al., 2017; Romagosa et al., 2015). While a lot of progress has been made confirming the health benefits of parks, Odenigbo (2019) identified the need to strengthen HPHP research about the mechanisms leading to health outcomes. For example, research examining the links between the potential health and wellness benefits of protected areas (PAs) and PA visitor motivations has been limited (Bricker, Hendricks, et al., 2016; Lemieux et al., 2016). Specifically, little is known about how health and wellness motivations for visiting PAs interact with visitors’ experiences and their perceptions of PA environments (Frash et al., 2016; Gómez & Hill, 2016). This paper contributes new perspectives in this area by exploring how wellness motivations interact with visitor perceptions of the PA environment, by examining the role of soundscapes.

**Literature review**

**Contemporary use of the wellness concept**

Wellness has commonly been conceptualized within the literature as a five or six-dimension construct. Over time, studies have most consistently included social, emotional, physical, intellectual, and spiritual dimensions of wellness (Crose et al., 1992; Depken, 1994; Hettler, 1980; Renger et al., 2000; Roscoe, 2009). While there has been a considerable amount of overlap across the existing wellness motivation scales, they each have unique components designed to meet their particular target participants and purposes.

The pursuit of wellness has long been connected with nature, and over the past few decades has increasingly been confirmed through research. Exposure to nature has been
linked with a number of physical fitness and wellness benefits, including better general health, reduced blood pressure and pulse rate, increased longevity, and reduced exposure to pollution (Mitchell & Popham, 2007, 2008; Pretty et al., 2007; Sandifer et al., 2015; Wells et al., 2007). Also, nature-based recreation and leisure experiences have been associated with a range of emotional and psychological wellness outcomes, including restorative benefits (Hartig et al., 1997; Kaplan, 1995), stress reduction (Morita et al., 2007; Ulrich et al., 1991), and the improvement of cognition and affect for people suffering from depression (Berman et al., 2012; McMahan & Estes, 2015; Sandifer et al., 2015). Along the social dimension of wellness, Sandifer et al. (2015) found evidence of increased social interactions, reduced aggression, positive intercultural and interracial interactions, and enhanced social support and cohesion.

Nature exposure and nature-connectedness, defined as feeling a sense of oneness with nature, have been associated with spiritual components of wellness (Heintzman, 2002; Howell et al., 2011; Sandifer et al., 2015). Along the intellectual dimension, Mackenzie et al. (2018) found that outdoor adventure activities enhanced academic performance in science-related disciplines amongst youth, and Sandifer et al. (2015) noted a number of cognitive benefits for all ages, including improved cognitive function, improved productivity, and reduced confusion. Considering the importance of nature for human wellness, and growing focus on utilizing nature to obtain wellness benefits, it is increasingly important to find ways to integrate visitor wellness considerations into the monitoring and management practices of PAs.

**Wellness concepts in the Chilean context**

There is increasing documentation of Andean and Latin American spiritual values that emphasize a view of nature (Pacha) and human-social realms as being fused, in contrast to the separateness of these realms within the western world (Coscieme et al., 2020; Díaz et al., 2015; Zimmerer, 2012). Earth-based spirituality is the oldest recorded religious worldview and the central tenet of the South American Pachamama cosmovision (Crane-Seeber & Crane, 2010). While there is ample evidence of the efforts made by post-Columbian forces to impose western-based spirituality, there has been a growing recognition of the cultural permanence of earth-based spiritual beliefs over the last decade, especially in light of a rising social movement oriented around the concept of Buen Vivir (To Live Well, in English, Coscieme et al., 2020; Gudynas, 2011; Nicoletti & Barelli, 2019; Villavicencio Calzadilla & Kotzé, 2018). Walsh noted, “In its most general sense, buen vivir denotes, organizes, and constructs a system of knowledge and living based on the communion of humans and nature and on the spatial-temporal-harmonious totality of existence” (2010, p. 18). Beginning in Bolivia and Ecuador, contemporary manifestations of Buen Vivir have been adopted by other South American cultures and countries, including Brazil, Columbia, Peru and Chile. These manifestations, driven through social movements, have contributed to the proposal of political and economic alternatives to mainstream neoliberal development theory, with a focus on agrarian, collective, and sustainable use of natural resources. Importantly, they posit a more direct connection between nature and human well-being, and align strongly with ecological concerns, indigenous principles and rights (Altmann, 2014; Bressa Florentin, 2019;
Bruckmann, 2010; Gudynas, 2011; Merino, 2016). This sense of harmony between humans and nature is fundamental to the Buen Vivir worldview (Gudynas, 2011). Although Buen Vivir is much larger, it associates spirituality with developing and experiencing nature, and immersive, sensory-based activities that allow individuals to experience their connection with nature (Gudynas, 2011; Walsh, 2010).

**Sounds, visitor experiences, healthy parks, and healthy people**

One of the important aspects of visitor experiences of PAs involves their encounters with sound; the ways in which sociocultural and natural sounds are perceived, and the ways in which sounds and soundscapes affect overall experiences. Visitor perceptions of sounds, noise (unwanted sounds), and their contributions and effects related to recreation and leisure experiences have been studied within PAs for more than 30 years (Harbrow et al., 2011). Early on, Driver et al. (1987) found that users of recreation areas ranked “escaping noises found in urban areas” fourth in importance amongst sixteen preference domains of primary reasons for visiting PAs. Noise within PAs, such as aircrafts, has been found to be annoying and to negatively affect visitors’ sense of solitude and tranquility (Mace et al., 1999; Tarrant et al., 1995).

A number of social science investigations have provided a better understanding of visitor perceptions of human-generated, or anthropogenic sounds within PAs, the effects of those sounds on visitor perceptions and experiences, and the development of soundscape related planning and management best practices (Benfield et al., 2010a, 2010b; Mace et al., 2004; Manning et al., 2006; Marin et al., 2011; Pilcher et al., 2009). For example, several PA soundscapes studies have used perception research to measure the acceptability and/or personal interpretation of particular sounds in order to inform soundscape management plans and develop indicators (i.e., Miller et al., 2018; Rapoza et al., 2015; Taff et al., 2014; Weinzimmer et al., 2014). Pilcher et al. (2009) employed visitor listening exercises to understand the degree to which visitors found sounds to be pleasing or annoying. Visitor-caused noises detracted from the quality of participants’ visitor experiences, and when they exceeded specific levels, they became unacceptable. Marin et al. (2011) studied pleasantness and annoyance of sounds in Muir Woods National Monument and found that motivations for experiencing a quiet setting can influence PA visitor sensitivity to noise.

Benfield et al. (2018) considered relationships between visitors’ recreation management attitudes, perceptions of anthropogenic sounds, and subsequent scenic landscape evaluations. Their findings demonstrated that visitor attitudes affected soundscape assessment. Like Marin et al. (2011), they identified the importance of understanding the specific visit expectations and motivations of visitors, in order to provide quality soundscape experiences. Francis et al. (2017), concentrated on understanding and managing how natural sounds play into human-nature synergies, in which both humans and wildlife receive greater health related ecosystem services (benefits) when natural soundscapes are conserved. Their research emphasized the need to understand how “experiences with sounds in protected areas influence visitors’ decisions to visit areas again” (p. 250).
In addition, soundscape research has begun to explore how the acoustic environment contributes to visitor health and wellness, as well as visitor experiences. For example, natural sounds have demonstrated restorative benefits such as increasing stress recovery capacity and attention restoration (Abbott et al., 2016; Benfield et al., 2014). Abbott et al. (2016) identified important contributions of soundscape research to the HPHP Science Plan and called for additional research directed at understanding the influence of natural sounds on human health and wellness, and the contribution of soundscapes to the park experience for both ecological and social health. Franco et al. (2017) documented several health and wellness benefits of natural sounds, including attention restoration, stress relief, and decreased anxiety and agitation. Further, natural sounds have been shown to positively impact visitor recreation experiences, including perceived naturalness, solitude, and freedom (Franco et al., 2017).

The current study has attempted to integrate these distinct research needs, through consideration of the HPHP literature, examination of how visit motivations associated with personal wellness might influence acoustic experiences, and subsequent intentions to visit PA areas again. This is particularly important, in the context of HPHP, as it can inform the development and prioritization of soundscape related PA visitor programming.

Visitor programming for soundscapes in PAs

Despite increased attention to the importance of natural soundscape preservation for visitor experiences, PA soundscape related visitor programming remains limited. Some interpretative resources have been focused on educating visitors about why natural sound preservation is important. The United States National Park System Natural Sounds Program (USNPS-NSP), as well as some of the parks, dedicate an area of their websites to explaining national park soundscapes and their importance (USNPS-NSP, 2018a; United States National Park System, Yellowstone National Park, 2019). Sound libraries have been created for some parks, which capture the unique natural sounds of parks, including their native birds, wildlife, and unique natural features like geysers, forests, and waterfalls (United States National Park System, Yellowstone National Park, 2020). Also, a number of different teaching activities and materials have been developed by the USNPS-NSP to help children build awareness and mindfulness about soundscapes (USNPS-NSP, 2018b).

Soundwalks are one of the aural focused activities that have been used to build understanding and mindfulness about soundscapes within PAs and natural areas (Adams et al., 2008). This technique was originally developed by R.M. Schafer during the evolution of the World Soundscapes Project in the late 1960s and early 1970s, as a research method for characterizing soundscapes (Adams et al., 2008). Westerkamp (1974) described soundwalks as purposeful excursions taken with a focus on listening to the environment, emphasizing their versatility for a range of purposes related to mindful listening, adaptable to a range of formats, locations, environments, and group types. McCartney (2012) described using soundwalks to explore a place through walking, using listening as the primary focus of attention.
Study purpose and research questions

While increasing evidence supports the consideration of soundscapes within the HPHP conceptualization (Abbott et al., 2016; Benfield et al., 2018; Francis et al., 2017; Marin et al., 2011; Miller et al., 2018; Weinzimmer et al., 2014), specific relationships between visitor's wellness motivations and sound and soundscape perceptions have not been explored. This study sought to explore intersects between HPHP, wellness motivations, and acoustic experience research, within a Chilean, South American context. Specific research questions included:

RQ1: What wellness motivations characterize participant decisions to visit the Coyhaique National Reserve (CNR) in Chile?

RQ2: How would cluster groups based on wellness motives differ across demographic variables?

RQ3: What is the relationship between participants’ wellness motivations and their soundscape-level ratings of appeal and desire for return visitation as a result of the soundscape?

RQ4: What is the relationship between participants’ wellness motivations and their appeal ratings of particular sounds within a PA?

Methods

Study setting

The research took place in Chile, approximately 1,650 km (1,025 miles) south of the nation’s capital, Santiago, in the iconic area of Patagonia. Similarly to other parts of the world in which HPHP work has been implemented (i.e., Australia, Canada, US), PAs in Chile are managed through a combination of planning instruments, including general management plans and specialized plans tailored to specific concerns (e.g., conservation, visitor management, resource management, etc.; Gale et al., 2018, 2019). Social research has suggested that while cultural idiosyncrasies exist, the general motivations, behaviors, and preferences of visitors to Chilean PAs are similar to those of visitors to PAs in the US, and many other parts of the world (Blair et al., 2019; Gale & Ednie, 2019; Gale et al., 2013, 2020, in press; Ried et al., 2019; Serenari et al., 2015).

According to the United Nation’s 2016 World Cities report, Chile is amongst the most urbanized countries in South America. It is one of 28 countries or areas of the world where greater than 40% of the urban population are agglomerated within a single city of more than 1,000,000 inhabitants (United Nations, Department of Economic & Social Affairs, Population Division, 2016). Chile’s urbanization has not only concentrated a higher number of people within existing urban spaces; rather, urban density growth has been accompanied by significant urban surface area growth throughout urban centers within much of the country, which has been shown to lead to landscape fragmentation, loss of natural habitats, air, noise, and water pollution, biodiversity threats, and a number of other social problems including congestion, segregation, and higher stress (CAAP, 2019). Most rural areas have also shifted toward processes of
urbanization, accompanied by significant land use, livelihood, environmental, and lifestyle changes (Jiménez et al., 2018). Sedentary lifestyles are common across all age groups within the population, with insufficient levels of physical activity for one in every five Chilean adults (Cristi-Montero & Rodríguez, 2014; Pan American Health Organization & World Health Organization, 2016). Obesity affects more than 60% of the population between 15 and 64 years of age (Food and Agriculture Organization of the United Nations et al., 2017), with close to 10% of all children under five years of age overweight. Green spaces within cities, considered critical public infrastructure for supporting urban health, are in short supply in Chile.

Increasing urbanization and separation from nature in Chile are particularly interesting in the context of HPHP goals, as these trends converge with increasing documentation of Buen Vivir spiritual and social values (Coscieme et al., 2020; Díaz et al., 2015; Zimmerer, 2012). Contemporary Buen Vivir manifestations, driven through recent social movements in Chile, seemingly align with HPHP programming objectives; thus, it is particularly interesting to examine well-being motivations and immersive acoustic experiences, in the Chilean context as, to date, HPHP has not been actively embraced within the Chilean PA system. This study may provide important policy implications for future research and programming within the Chilean context (Gudynas, 2011; Walsh, 2010).

Thus, the Chilean context was purposefully chosen, because of similarities to other countries in tourism and recreation use of PAs, growing nature deprivation amongst the country’s increasingly urban population, and a need for increased health and wellness focus and outcomes. By conducting this study within the chosen Chilean context, we hope to help build understanding of wellness motivations and acoustic sensory experiences, expand HPHP research to a new geographic region of the world, and illuminate cultural nuances that can facilitate HPHP effectiveness in a South American setting.

Specifically, the study was conducted in the Coyhaique National Reserve (CNR), approximately five kilometers northeast of the city of Coyhaique, within the Aysén region (Figure 1). The CNR landscape encompasses the eastern summit of Cinchao Mountain, which transitions the geography between fjords to the west and steppe to the east. Managed by The Chilean National Forestry Corporation, the agency in charge of administering Chile’s National System of Natural Protected Areas, recreationists visit the CNR predominantly for hiking, biking, and picnicking.

**Visitor sampling**

This study utilized six sample sites within CNR, chosen specifically for their range of natural and social environments (Figure 1). All visitors 18 years of age and above were intercepted. Data were collected during the Chilean summer months of January through March 2019. During the 63 days of sampling, 1,108 visitors were approached, and 899 completed the survey, achieving a response rate of 81.1%.

**Survey design**

The survey included four main components: participant demographics, wellness motivations, a listening and sound rating exercise, and ratings of the soundscape as a whole.
Participant demographic information collected included: age, gender, language, group type (alone, with friends and/or family, or an organized/commercial group), and visitor type (local, national, or international). For the listening exercise, participants were asked to focus for two minutes of listening, and then list all of the sounds they heard. Following the listening exercise, and consistent with existing research (Miller et al., 2018), participants were asked to provide their personal interpretation rating by rating the appeal of each sound they heard. To obtain perceptions of the combinations of

Figure 1. Map of study setting, Coyhaique National Reserve, Aysén, Chile.
sounds heard (the overall soundscape), participants were asked to rate whether they found the soundscape to be appealing, and whether the sounds they heard made them want to visit more often.

Research into outdoor recreation motives most frequently applies Driver’s (1983) outdoor recreation participation motivation typologies, which have been developed into Recreation Experience Preference (REP) scales (Driver, 1983; Graefe et al., 2010; Manfredo et al., 1996; Sotomayor et al., 2014). Although REP scales have demonstrated validity and reliability across studies (Hall et al., 2010; Manfredo et al., 1996), studies tend to include selected sets of items from the REP domain scales that are most relevant to their research purposes (Graefe et al., 2000; Lee et al., 2002; Sotomayor et al., 2014). The eighteen REP question items selected for this study included items from the “combining family togetherness and similar people,” “new people,” “physical fitness,” “scenery,” “enjoy nature,” “learning,” “pressures,” “escape physical pressure,” and “escape personal-social pressures” REP domain scales (Manfredo et al., 1996). The selected REP items related to physical, social, emotional, spiritual, and intellectual wellness. In addition, the item, “to be in clean air” was added to reflect the important role of CNR as being “huge lungs for the city,” as identified by stakeholders during the development of the current Visitor Use Plan (National Forestry Corporation of Chile, 2017). The survey was designed in the English language and was translated into Spanish. Participants were given the option to complete the survey in either Spanish or English.

**Data analysis**

Exploratory factor analysis was selected for dimension reduction of the wellness motivation items, considering the cultural context of the study and that the items have not previously been adopted as a specific set representing wellness motivations. Scree plots and eigenvalue scores were examined to determine the number of factors the data represented. A five-factor solution was selected as it yielded eigenvalues each representative of at least 5% of the variance, accounting together for 62% of the variance, with subsequent factors explaining less of the variance (Matsunaga, 2010). Principal axis factoring with promax rotation was completed, specifying five factors. Factor scores of at least .40 were sought as indicators of acceptable reliability (Costello & Osborne, 2005; Vaske, 2008). Chronbach’s alpha values of internal consistency, along with item correlations were then measured to evaluate scale dimension reliability.

The K-means clustering procedure, using mean motivation dimension scores (mean scores of items which loaded onto each factor), was applied to split participants into wellness motivation groups. Mean dimension scores preserve the variation in the item ratings and are found to be appropriate for subsequent applications following exploratory factor analysis (DiStefano et al., 2009). Solutions of two to five clusters were considered, and the final cluster solution was validated using discriminant analysis (Serenari et al., 2015). Since the wellness dimensions and soundscape rating variables were measured on Likert-type scales (ordinal data) and data for several variables were not normally distributed, requirements for parametric tests were not met and non-parametric comparison and correlation tests were selected. Chi-square tests with Cramer’s V
tests for effect size were used to identify differences among the demographic variables between the wellness motive groups. Kruskal–Wallis tests with post hoc Dunn’s pairwise comparison tests were completed to test for differences in soundscape appeal and desire to visit more as a result of the soundscape ratings between the wellness motive groups. Spearman’s rho was used to assess the correlation between wellness motive dimensions and soundscape ratings, and between wellness motive dimensions and sound-specific appeal ratings.

Participant sound observations were recorded by the investigators and the open-ended responses were subsequently open-coded identifying prominent themes and developed into sound categories following methods discussed by Elliott and Timulak (2005).

Limitations

The scales used within the survey instrument were adapted from English to Spanish, using a process of work between bilingual native speakers of both languages that involved an initial translation, followed by dialogue between the two, to assure the proper contextual translation. Next, the instrument was tested with the field research team (six people), using a focus group setting, to confirm understanding. Although a rigorous process was employed, it is possible that some of the terms were understood differently in Spanish, resulting in contextual differences. Second, a goal for the cluster analysis of the wellness dimension ratings was to identify groups that contrast in terms of their wellness motivations. The analysis did reveal four very distinct groups, however, the low-motivation group size was much smaller as compared with the rest of the groups. With \( n = 39 \) in this low-motivation group, the decision was made that the opportunity to use this group for contrast outweighed concerns over equal group sizes.

Results

The majority (75%) of participants were 18–35 years of age and Spanish speaking (90%). Most participants (86%) were in CNR with friends and/or family. Approximately two-thirds (65%) of participants were national tourists, and the other third was evenly split between locals and international tourists (Table 1).

RQ1: What wellness motivations characterize participant decisions to visit the CNR?

Following factor analysis, the identified five-factor solution represented emotional, intellectual, physical, sensory, and social dimensions of wellness (Table 2). The makeup of the emotional, physical, and social dimensions were consistent with existing wellness dimension classifications (Depken, 1994; Hettler, 1980; Renger et al., 2000; Roscoe, 2009), however the anticipated intellectual and spiritual dimensions materialized uniquely. Two items which were anticipated to represent spiritual wellness loaded with, “to learn more about nature,” forming the intellectual wellness dimension. Other items anticipated to load within a spiritual wellness dimension loaded with more experiential/nature immersion items such as “to experience open space” and “to be outdoors” and were therefore classified as sensory motives (since spiritual-related items spanned more than one dimension). The emotional dimension had a high mean rating score
Table 1. Participant characteristics.

<table>
<thead>
<tr>
<th>Participant characteristics</th>
<th>% (n)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
</tr>
<tr>
<td>18–25 years</td>
<td>36% (320)</td>
</tr>
<tr>
<td>26–35 years</td>
<td>39% (353)</td>
</tr>
<tr>
<td>36–45 years</td>
<td>12% (112)</td>
</tr>
<tr>
<td>46–55 years</td>
<td>7% (60)</td>
</tr>
<tr>
<td>55+ years</td>
<td>6% (54)</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>48% (431)</td>
</tr>
<tr>
<td>Male</td>
<td>52% (465)</td>
</tr>
<tr>
<td>Language</td>
<td></td>
</tr>
<tr>
<td>Spanish</td>
<td>90% (808)</td>
</tr>
<tr>
<td>English</td>
<td>10% (91)</td>
</tr>
<tr>
<td>Group type</td>
<td></td>
</tr>
<tr>
<td>Alone</td>
<td>12% (107)</td>
</tr>
<tr>
<td>Friends and/or family</td>
<td>86% (773)</td>
</tr>
<tr>
<td>Organized or commercial group</td>
<td>2% (19)</td>
</tr>
<tr>
<td>Visitor type</td>
<td></td>
</tr>
<tr>
<td>Locals</td>
<td>18% (162)</td>
</tr>
<tr>
<td>National tourists</td>
<td>65% (586)</td>
</tr>
<tr>
<td>International tourists</td>
<td>17% (151)</td>
</tr>
</tbody>
</table>

Table 2. Wellness dimension factor loadings, internal consistency, M and SD.

<table>
<thead>
<tr>
<th>Emotional dimension</th>
<th>Intellectual dimension</th>
<th>Physical dimension</th>
<th>Sensory dimension</th>
<th>Social dimension</th>
</tr>
</thead>
<tbody>
<tr>
<td>To give your mind a rest</td>
<td>.79</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>To experience tranquility</td>
<td>.77</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>To relieve some built-up tensions</td>
<td>.85</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>To get away from the usual demands of life</td>
<td>.68</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>To experience the sounds of nature</td>
<td>.80</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>To enjoy the smells of nature</td>
<td>.83</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>To learn more about nature</td>
<td>.48</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>To keep physically fit</td>
<td>.91</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Challenge of a sport/exercise</td>
<td>.76</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>To be outdoors</td>
<td>.51</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>To view the scenic beauty</td>
<td>.49</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>To experience open space</td>
<td>.50</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>To enjoy peace and quiet</td>
<td>.53</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>To be in clean air</td>
<td>.38</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>To do something with your family and/or friends</td>
<td>.58</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Items not assigned to any factor</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>To let your kids be outdoors</td>
<td>.42</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>To meet new people</td>
<td>.28</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>To experience new and different things</td>
<td>.23</td>
<td>.13</td>
<td>.18</td>
<td>.10</td>
</tr>
<tr>
<td>Number of Items</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>Chronbach’s $\alpha$</td>
<td>.80</td>
<td>.80</td>
<td>.79</td>
<td>.73</td>
</tr>
<tr>
<td>Eigenvalue</td>
<td>5.82</td>
<td>1.63</td>
<td>1.48</td>
<td>1.20</td>
</tr>
<tr>
<td>% Variance explained</td>
<td>32.34%</td>
<td>9.03%</td>
<td>8.20%</td>
<td>6.67%</td>
</tr>
<tr>
<td>Dimension $M$</td>
<td>4.35</td>
<td>4.18</td>
<td>3.81</td>
<td>4.57</td>
</tr>
<tr>
<td>Dimension SD</td>
<td>.69</td>
<td>.70</td>
<td>.90</td>
<td>.41</td>
</tr>
</tbody>
</table>

Note. Items 1–5 measured on a 5-point scale, 1 = not at all important, 5 = extremely important.

$(M = 4.35)$ and included items related to stress reduction and escape from demands. The intellectual dimension was also relatively high $(M = 4.18)$ and included experiencing and enjoying the sounds and smells of nature as well as learning more about nature.
The physical dimension, including fitness and challenge items, had a lower mean rating compared with the other dimensions \((M = 3.81)\). The highest-rated dimension represented more sensory motives including experiencing nature, open space, peace and quiet, scenic beauty, and clean air \((M = 4.57)\). Last, a single-item social wellness dimension was identified, representing the item, “to do something with your family and/or friends.” Two other items from the original set of questions, intended to be representative of social wellness, were dropped, because although their factor scores were acceptable \((.42 \text{ and } .44)\), they failed to display adequate internal consistency and were only weakly correlated \((\text{Chronbach’s alpha was } .433 \text{ and } r = .13–.28)\). The social dimension had a mean score higher than the physical dimension \((M = 4.01)\), but lower than the emotional, intellectual and sensory dimensions.

RQ2: How would cluster groups based on wellness motives differ across demographic variables?

A four-group cluster solution was identified and validated by discriminant analysis, where 100% of the cases were successfully grouped (Table 3). Group one had low-wellness motives compared to the other groups, and the value this group brought in terms of contrasting low to high wellness motives justified the group’s inclusion given its small group size \((n = 39)\). Group two had moderate-wellness motives \((n = 336)\), and two groups had high-wellness motives (groups three and four). Group three (high-wellness friend/family, \(n = 450\)), and group four (high-wellness soloists, \(n = 74\)) were similar across all dimensions except for social wellness, which group three members rated high, and group four members rated low.

The Chi-square tests identified patterns in participant characteristics/demographics across the wellness motive groups (Table 4). The low-wellness motives group was composed of greater proportions of international tourists (61%) and English speakers (46%) than all of the other groups and had more participants visiting alone (74%) than all but the high-wellness soloist group. Although the low-wellness cluster group expressed a high level of sensory motives (cluster centered at 4.06, very important) and mid-range levels of intellectual and emotional wellness motives, mean scores for all of the five wellness dimensions were lowest for this group, as compared with the other three clusters. Further, mean scores were below the level of moderate importance \((2.88 \text{ and } 1.05, \text{ respectively})\) for the physical and social wellness dimensions.

Although skewed heavily toward Spanish speaking, national tourists, the moderate-wellness motives group had the second highest concentration of English speakers and
international tourists (14% and 21%, respectively). Nevertheless, both characteristics were much less pronounced as compared to the low-wellness motives group. The vast majority of participants within this group were traveling with friends and/or family (96%) and over half (57%) were male. The moderate-wellness motives group had mean dimension scores above three (moderately important) for all five wellness dimensions. For this group, the sensory and social wellness dimensions were highest rated, with mean scores above four (very important). Again, physical wellness motives were least favored, with mean values only slightly higher than the low-wellness motives cluster.

The high-wellness friends/family motives group was heavily skewed toward younger Spanish-speakers (76% between the ages of 18 and 35; 95% Spanish-speakers), with the highest proportion of national tourists among the groups (70%), and also the highest proportion of locals (20%). Almost everyone (94%) in this group reported visiting the CNR with family and/or friends; however, this group had a greater proportion of female participants (54%), versus the other groups. The mean dimension scores for this group were above four (very important) for all five wellness dimensions. As with the other groups, sensory wellness motives were rated highest and physical wellness motives were lowest rated. The high-wellness friends/family motives group had the highest rankings for the emotional, social, and intellectual wellness motive dimensions amongst the four groups (in that order).

The high-wellness soloist motives group was heavily skewed toward younger Spanish-speakers (76% between the ages of 18 and 35; 95% Spanish-speakers), with the highest proportion of national tourists among the groups (70%), and also the highest proportion of locals (20%). Almost everyone (94%) in this group reported visiting the CNR with family and/or friends; however, this group had a greater proportion of female participants (54%), versus the other groups. The mean dimension scores for this group were above four (very important) for all five wellness dimensions. As with the other groups, sensory wellness motives were rated highest and physical wellness motives were lowest rated. The high-wellness friends/family motives group had the highest rankings for the emotional, social, and intellectual wellness motive dimensions amongst the four groups (in that order).

In contrast to the friends/family motives group, the high-wellness soloist motives group skewed more heavily male (59%), with a predominance of national tourists largely visiting

### Table 4. Participant characteristics across the wellness motive groups.

<table>
<thead>
<tr>
<th>Wellness motive groups % (n)</th>
<th>Low-wellness</th>
<th>Moderate-wellness</th>
<th>High-wellness friends/family</th>
<th>High-wellness soloists</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Group 1</strong></td>
<td><strong>Group 2</strong></td>
<td><strong>Group 3</strong></td>
<td><strong>Group 4</strong></td>
<td>Total</td>
<td></td>
</tr>
<tr>
<td><strong>Age (x^2 = 16.23, df = 12, p = .18, V = .08)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18–25 years</td>
<td>15% (6)</td>
<td>37% (125)</td>
<td>38% (169)</td>
<td>27% (20)</td>
<td>36% (320)</td>
</tr>
<tr>
<td>26–35 years</td>
<td>44% (17)</td>
<td>39% (132)</td>
<td>38% (171)</td>
<td>45% (33)</td>
<td>39% (353)</td>
</tr>
<tr>
<td>36–45 years</td>
<td>18% (7)</td>
<td>11% (37)</td>
<td>12% (54)</td>
<td>19% (14)</td>
<td>12% (112)</td>
</tr>
<tr>
<td>46–55 years</td>
<td>10% (4)</td>
<td>7% (23)</td>
<td>6% (29)</td>
<td>5% (4)</td>
<td>7% (60)</td>
</tr>
<tr>
<td>55+ years</td>
<td>13% (5)</td>
<td>6% (19)</td>
<td>6% (27)</td>
<td>4% (3)</td>
<td>6% (54)</td>
</tr>
<tr>
<td>Total</td>
<td>100% (39)</td>
<td>100% (336)</td>
<td>100% (450)</td>
<td>100% (74)</td>
<td>100% (899)</td>
</tr>
<tr>
<td><strong>Gender (x^2 = 10.49, df = 3, p = .02, V = .11)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>44% (17)</td>
<td>43% (144)</td>
<td>54% (240)</td>
<td>41% (30)</td>
<td>48% (431)</td>
</tr>
<tr>
<td>Male</td>
<td>56% (22)</td>
<td>57% (190)</td>
<td>46% (209)</td>
<td>59% (44)</td>
<td>52% (465)</td>
</tr>
<tr>
<td>Total</td>
<td>100% (39)</td>
<td>100% (334)</td>
<td>100% (449)</td>
<td>100% (74)</td>
<td>100% (896)</td>
</tr>
<tr>
<td><strong>Language (x^2 = 75.41, df = 3, p = .00, V = .29)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spanish</td>
<td>54% (21)</td>
<td>86% (290)</td>
<td>95% (429)</td>
<td>92% (68)</td>
<td>90% (808)</td>
</tr>
<tr>
<td>English</td>
<td>46% (18)</td>
<td>14% (46)</td>
<td>5% (21)</td>
<td>8% (6)</td>
<td>10% (91)</td>
</tr>
<tr>
<td>Total</td>
<td>100% (39)</td>
<td>100% (336)</td>
<td>100% (450)</td>
<td>100% (74)</td>
<td>100% (899)</td>
</tr>
<tr>
<td><strong>Group type (x^2 = 458.72, df = 6, p = .00, V = .71)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alone</td>
<td>74% (29)</td>
<td>2% (8)</td>
<td>4% (17)</td>
<td>72% (53)</td>
<td>12% (107)</td>
</tr>
<tr>
<td>Friends and/or family</td>
<td>21% (8)</td>
<td>96% (322)</td>
<td>94% (422)</td>
<td>28% (21)</td>
<td>86% (773)</td>
</tr>
<tr>
<td>Organized or commercial group</td>
<td>5% (2)</td>
<td>2% (6)</td>
<td>2% (11)</td>
<td>0% (0)</td>
<td>2% (19)</td>
</tr>
<tr>
<td>Total</td>
<td>100% (39)</td>
<td>100% (336)</td>
<td>100% (450)</td>
<td>100% (74)</td>
<td>100% (899)</td>
</tr>
<tr>
<td><strong>Visitor type (x^2 = 75.80, df = 6, p = .00, V = .29)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Locals</td>
<td>8% (3)</td>
<td>16% (55)</td>
<td>20% (91)</td>
<td>18% (13)</td>
<td>18% (162)</td>
</tr>
<tr>
<td>National tourists</td>
<td>31% (12)</td>
<td>63% (210)</td>
<td>70% (314)</td>
<td>67% (50)</td>
<td>65% (586)</td>
</tr>
<tr>
<td>International tourists</td>
<td>61% (24)</td>
<td>21% (71)</td>
<td>10% (45)</td>
<td>15% (11)</td>
<td>17% (151)</td>
</tr>
<tr>
<td>Total</td>
<td>100% (39)</td>
<td>100% (336)</td>
<td>100% (450)</td>
<td>100% (74)</td>
<td>100% (899)</td>
</tr>
</tbody>
</table>

Note. Values with different superscript letters differ significantly from each other at the .05 level.
CNR alone (67% national tourists, 72% visiting alone). This group shared a younger demographic profile similar to the high-wellness friends/family group (72% between the ages of 18 and 35). The mean scores for sensory and intellectual motives were almost identical between the two high-wellness motives groups; however, the soloists mean scores for emotional and physical wellness dimensions were lower than the friends/family group and social wellness scores were almost three points lower (1.59 vs. 4.56).

RQ3: What is the relationship between participants’ wellness motivations and their soundscape-level ratings of appeal and desire for return visitation as a result of the soundscape?

Participants indicated their agreement with the statements, “I find the soundscape appealing” and, “these sounds make me want to visit more” (each on a 7-point scale where 1 = not at all, and 7 = completely). Overall, the participants provided high ratings of the soundscape appeal (M = 6.32, SD = .96) and a desire to visit more as a result of the soundscape (M = 6.36, SD = 1.05). Kruskal–Wallis tests identified differences in ratings of the soundscape appeal and desire to visit more (as a result of the soundscape), between the wellness motive groups (X²(3) = 37.97, p < .001, and X²(3) = 80.16, p < .001, respectively). Dunn’s pairwise comparison tests indicated the low, moderate, and high-wellness motives groups all significantly differed in both their soundscape appeal and desire to visit more ratings. For soundscape appeal, the low group provided the lowest ratings, the moderate group higher, and the high-wellness friends/family group provided the highest ratings. The high-wellness soloists motives group did not significantly differ from the moderate or high-wellness friends/family motives groups, but did provide significantly higher appeal and desire to visit more ratings than the low-wellness motives group. For the desire to visit more as a result of the soundscape, both of the high-wellness groups provided significantly higher ratings than the low and moderate wellness motive groups (Figure 2).

The wellness motive dimensions were all significantly correlated, with Spearman correlation coefficients ranging from .17 to .54 (Table 5). Correlation coefficients were strongest between the emotional, intellectual, and sensory dimensions. The wellness dimensions were all also significantly correlated with the two soundscape perception ratings, with correlation coefficients ranging from .15 to .20 for soundscape appeal and .13 to .30 for a desire to visit more.

RQ4: What is the relationship between participants’ wellness motivations and their appeal ratings of particular sounds within a PA?

Participants observed a total of 3,623 sounds, which were open coded into 10 categories. The most prevalent sound categories represented natural sounds, including birds (n = 711), wind (n = 665), forest (n = 523), and wind/forest interactions (e.g., the sound of wind moving trees, n = 429). The most prevalent anthropogenic sound was human voices (n = 388) followed by the sound of machines (n = 169), which were largely represented by a pine plantation harvesting project reestablishing native forest, occurring nearby to one of the sample sites. There were no significant differences in the number of sounds heard across the wellness motive groups (X²(27) = 19.04, p = .87).

Wind, forest, forest/wind interactions, water, and birds were the highest rated sounds. These were followed by the sounds of other animals and the participants’ personal
sounds, which included the sound of their breath, their hearts pounding, their footsteps, and wind or water hitting their skin and clothing (Figure 3). Insect sounds were rated lower than the other natural sounds ($M = 1.25$). The sounds of machines were by far the lowest-rated overall ($M = 1.93$). Human voices were rated higher than machines, but low compared to most natural sounds ($M = 0.79$).

Bivariate correlation analyses identified significant correlations between the wellness motive dimensions and some of the sound appeal ratings (Table 6). The intellectual and sensory wellness motive dimensions were significantly correlated with wind, forest, wind/forest interaction, and water appeal ratings (Spearman rho’s .14–.21). The emotional wellness motive dimension was significantly correlated with wind, forest and water appeal ratings (Spearman rho’s .11–.17), but not with wind/forest interaction ratings. The physical and social wellness motive dimensions scores were only significantly correlated with water appeal ratings (Spearman rho’s .18 and .16, respectively). The intellectual wellness motive ratings were significantly correlated with all of the natural

**Table 5.** Correlation matrix of wellness dimensions, soundscape appeal, and soundscape’s causation of a desire to visit more.

<table>
<thead>
<tr>
<th></th>
<th>1.</th>
<th>2.</th>
<th>3.</th>
<th>4.</th>
<th>5.</th>
<th>6.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emotional motives</td>
<td>4.35</td>
<td>.69</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intellectual motives</td>
<td>4.18</td>
<td>.70</td>
<td>.44**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical motives</td>
<td>3.81</td>
<td>.90</td>
<td>.30**</td>
<td>.26**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sensory motives</td>
<td>4.57</td>
<td>.41</td>
<td>.54**</td>
<td>.54**</td>
<td>.30**</td>
<td></td>
</tr>
<tr>
<td>Social motives</td>
<td>4.01</td>
<td>1.14</td>
<td>.24**</td>
<td>.21**</td>
<td>.17**</td>
<td>.24**</td>
</tr>
<tr>
<td>Soundscape appeal</td>
<td>6.32</td>
<td>.96</td>
<td>.19**</td>
<td>.20**</td>
<td>.15**</td>
<td>.20**</td>
</tr>
<tr>
<td>Soundscape creates desire to visit more</td>
<td>3.36</td>
<td>1.05</td>
<td>.28**</td>
<td>.30**</td>
<td>.13**</td>
<td>.30**</td>
</tr>
</tbody>
</table>

*Note.* Items 1–5 measured on a 5-point scale, 1 = not at all important, 5 = extremely important; items 6 and 7 measured on a 7-point scale, 1 = do not at all agree, 7 = completely agree.

**Correlation is significant at the .01 level (2-tailed).**

Figure 2. Mean soundscape appeal and soundscape creates a desire to visit more ratings for the four wellness motive groups.
sounds, including birds, animals and insects beyond those listed previously (Spearman rho’s .12–.45), and the sensory motive ratings were also significantly correlated with animal and insect appeal ratings (Spearman rho’s .42 and .18, respectively). None of the wellness motive dimension scores were significantly correlated with anthropogenic sounds, with the exception of a weak correlation (Spearman rho .11) between social wellness motives and the sound of voices.

Discussion and implications

The wellness motives that drive visits to CNR

The sensory wellness motive dimension emerged as the most important motivator for visiting the CNR, with a mean score of 4.57 out of 5. Considering that 83% of the study sample were local visitors and national tourists, the high importance of sensory wellness motives may indicate a way of looking at the world as an interconnected system, where people and nature are in close communion, consistent with pachamama cosmovision and related tenets of the Buen Vivir political and social movements in Chile. Emotional, intellectual, and social wellness motives were also of high importance to participants ($M = 4.35$, $M = 4.18$, and $M = 4.01$, respectively). The influence of emotional motives supports previous work documenting the perceived emotional benefits of nature-based recreation, which include attention restoration, stress reduction, and improved affect for those with depression (Kaplan, 1995; Sandifer et al., 2015; Ulrich et al., 1991). For intellectual wellness motives, it is notable that the factor analysis and internal consistency analyses demonstrated that participants responded similarly to the “learn about nature” statement as they did to the more nature immersion-related statements (“to experience the sounds of nature,” and “to enjoy the smells of nature”). This suggests that participants may value a particular way of engaging with intellectual wellness, that emphasizes active, sensorial, place-based learning approaches, consistent with the cultural tenets of

![Figure 3. Mean appeal ratings of the observed sound codes.](image-url)
Table 6. Correlation matrix of mean wellness dimension scores and mean sound ratings.

<table>
<thead>
<tr>
<th></th>
<th>M</th>
<th>SD</th>
<th>Wind</th>
<th>Forest</th>
<th>Wind/Forest</th>
<th>Water</th>
<th>Birds</th>
<th>Other Animals</th>
<th>Insects</th>
<th>Personal</th>
<th>Voices</th>
<th>Machines</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emotional wellness motives</td>
<td>4.36</td>
<td>.69</td>
<td>.17**</td>
<td>.11*</td>
<td>.07</td>
<td>.16**</td>
<td>-.00</td>
<td>.13</td>
<td>.10</td>
<td>.22</td>
<td>.09</td>
<td>.05</td>
</tr>
<tr>
<td>Intellectual wellness motives</td>
<td>4.20</td>
<td>.69</td>
<td>.18**</td>
<td>.20**</td>
<td>.14**</td>
<td>.19**</td>
<td>.12**</td>
<td>.45*</td>
<td>.20**</td>
<td>.17</td>
<td>.09</td>
<td>.09</td>
</tr>
<tr>
<td>Physical wellness motives</td>
<td>3.81</td>
<td>.91</td>
<td>.06</td>
<td>.03</td>
<td>.04</td>
<td>.18**</td>
<td>.06</td>
<td>.18</td>
<td>-.05</td>
<td>.07</td>
<td>.01</td>
<td>.09</td>
</tr>
<tr>
<td>Sensory wellness motives</td>
<td>4.58</td>
<td>.41</td>
<td>.15**</td>
<td>.21**</td>
<td>.15**</td>
<td>.20**</td>
<td>.06</td>
<td>.42*</td>
<td>.18**</td>
<td>.23</td>
<td>.02</td>
<td>.06</td>
</tr>
<tr>
<td>Social wellness motives</td>
<td>4.03</td>
<td>1.12</td>
<td>.00</td>
<td>.01</td>
<td>.03</td>
<td>.16**</td>
<td>.02</td>
<td>.30</td>
<td>.02</td>
<td>-.04</td>
<td>.11*</td>
<td>.01</td>
</tr>
</tbody>
</table>

**Correlation is significant at the .01 level, *Correlation is significant at the .05 level (2-tailed).
the Buen Vivir movement. The importance of social wellness motives, and the specific “to do something with family and/or friends” item, is logical as the majority of participants (86%) reported that they were visiting along with a family and/or friends group. Physical wellness motives of “to keep physically fit” and the “challenge of a sport/exercise” were of least importance to participants. These motives may have been higher if the study had captured a greater proportion of local visitors, who reported high use of the CNR for physical fitness activities during the 2017 visitor use planning process (National Forestry Corporation of Chile, 2017). Replicating the current study in the CNR during other parts of the year, when local visitation is more dominant, is suggested.

Regarding HPHP, a better understanding of visitor wellness motivations may help PA managers to direct limited resources in ways that will enable them to facilitate the wellness goals of their particular visitor profiles (Frash et al., 2016; Gómez & Hill, 2016; Odenigbo, 2019). For example, Romagosa et al. (2015) identified the importance of PA environments with calm, serene, and natural soundscapes for restoration and other benefits associated with emotional and spiritual wellness. They identified benefits associated with exercise trails, camping, and picnic infrastructure for physical and social wellness. Results of the current study suggest that to facilitate the wellness benefits participants expressed, CNR managers should focus on creating opportunities for their visitors to immerse themselves in the natural setting. While trails, picnic areas, overlooks, and other social and physical wellness infrastructure remain important, increasing opportunities for visitors to experience calm, serene, natural settings, in a sensory-based and immersive manner may be of higher priority. Research is warranted to explore the interactions and relationships between wellness dimensions and the types of infrastructure available in distinct types of natural and PA settings.

**How cluster groups based on wellness motives differ across demographic variables**

The two high-wellness motives groups combined (friends/family and soloists), represented the majority of the study sample (58%). These results are encouraging, considering the HPHP focus on promoting health-related human relationships with nature (Townsend & Henderson-Wilson, 2016). Nevertheless, almost half (42%) of participants in the current study clustered within the moderate and low-wellness motives groups. Future research and programming should focus on understanding these groups and their particular motives, in order to effectively encourage new nature-related wellness connections.

Comparison of demographic similarities and differences between wellness motive cluster groups provides hints as to how to proceed. For example, the four groups contained similar age demographics, with an overall prevalence of younger visitors and relatively small numbers of visitors over the age of 46 (13% of the overall sample). Gender results were also fairly similar across the four groups. The more striking demographic differences in the current study occurred with the group type, visitor type, and related language variables. The two groups with disproportionately higher numbers of solo visitors were the low-wellness group and the high-wellness soloists group. As
would be expected, the social wellness motive ratings of these two groups were considerably lower than those of the other two wellness groups. This contrast suggests that social wellness may behave differently than other wellness dimensions, warranting further research. From a visitor use management standpoint, this suggests the importance of facilitating a range of social contexts within PA visitor use areas, with clear information that allows visitors to understand where to encounter the social conditions they seek.

Another notable trend involved visitor type and language, which reflected a linear increase in the proportion of national tourists and Spanish speaking participants, from low- to high-wellness motive groups. Although differences for local participants between the cluster groups were not significant, the numbers trended similarly across motive groups. This tendency supports further investigation to explore whether Chileans recognize their PAs as being providers of wellness benefits, and how they value these benefits within the concept of ecosystem services, especially in consideration of growing support for Buen Vivir principles. Although the within-cluster group proportions of international visitors decreased across the motive groups (moving from low- to high-wellness), it is important to note that the majority (77%) of international visitors still clustered within the moderate- and high-wellness motive groups. This suggests that it is important to look beyond demographics to understand PA visitors and their priorities and behaviors.

**Relationships between wellness motivations and soundscape ratings**

Participants in the high-wellness groups rated the soundscape as significantly more appealing as compared with low- and moderate-wellness groups. And, of the five dimensions, emotional, intellectual, and sensory wellness motives had the strongest correlations with appeal, and desire to visit more as a result of the soundscape. Similar wellness motives have been associated with many of the benefits attributed to nature and to natural sounds, including those of attention restoration (Kaplan, 1995), and stress recovery (Ulrich et al., 1991).

An increasing body of work has identified the importance of these two theories as representative of the psychological wellness benefits associated with nature experiences (Abbott et al., 2016; Benfield et al., 2014; Franco et al., 2017; Mace et al., 1999). CNR results support the position taken by this line of research. High participant expressions of appeal and desire to return, linked to soundscape immersion, seemed to facilitate emotional (or psychological) wellness benefits through a direct connection to nature. By helping visitors achieve their wellness goals, soundscapes become an example of the HPHP concept. This suggests programming implications including the potential for onsite sensory-based programming, like soundwalks, to contribute to HPHP goals by connecting with visitor wellness motivations.

Individual and group soundwalk programs could be designed and targeted to align with wellness-motive cluster profiles. For example, individual programs could target those with lower social wellness motives, allowing them to mindfully experience sounds on their own, in a way that would be more likely to connect with sensory and emotional wellness motives. For these visitors, soundwalks might be directed toward less
congested areas, where there is a greater potential for solitude and may consist of walking in silence, before taking a pause to stand or sit still and absorb the sounds of the PA. Guided, interpretative soundwalks might better connect with medium- and high-wellness motive clusters. These would allow social groups to experience soundscapes together, using the physical experience of guided hiking and mindful listening to achieve/gain spiritual, emotional, and intellectual benefits. Having a better understanding of wellness motives and the ways in which they manifest for visitors, programmers can design soundwalks and similar interpretive activities to support spiritual and intellectual wellness experiences. In doing so, perhaps soundscape programs can evolve to influence visitors’ wellness benefits and connect them to parks in a more fundamental manner.

The relationship between participants’ wellness motivations and their appeal ratings for particular PA sounds

The present study reinforces the importance of natural sounds, while adding specific perceptual findings about various natural and anthropogenic sound categories in the CNR context (Franco et al., 2017). Except for insect sounds, natural sounds were consistently rated near or above 3.5 on the scale of −4, very annoying to +4, very pleasing. Personal sounds were a common, and positive observation (mean rating = 3.08) and typically included the sounds of wind or rain moving a participant’s clothing or the sound of their breath. This type of sound has not been mentioned in the PA soundscape literature and may be an interesting manifestation of how visitors enjoy the experiential aspects of being outdoors. The two more common anthropogenic sounds, human voices and machines, were rated lower than other sounds, as expected (Marin et al., 2011; Miller et al., 2018); however, the sounds of human voices were rated above 0, neutral; signifying that for many participants they had not yet become annoying (Pilcher et al., 2009). The mean rating for machine sounds was negative (mean rating = −1.93) suggesting these sounds were annoying for many respondents, even though the forestry project was a PA initiative and educational material was in place to inform visitors of its purpose.

With the exception of birds, which participants thoroughly enjoy regardless of their wellness motives, natural sounds ratings were positively correlated with intellectual, sensory, and emotional wellness motives. Intellectual wellness motivations demonstrated the most consistent correlation with all of the natural sounds. In contrast, none of the wellness motive dimensions were significantly correlated with anthropogenic sounds (except for social wellness and the sound of human voices). For participants in the CNR, sound-specific relationships demonstrated that the intellectual, sensory, and emotional health benefits discussed in the previous section related to natural sounds, more than to anthropogenic sounds. An understanding of preferred natural sounds will help PA programmers to develop relevant soundscape related wellness activities. Programs centered around birds and their sounds may be a logical starting place for PAs considering new interpretive/educational programming, since bird sounds were the highest rated sound regardless of wellness motives.
Conclusions

As efforts continue to connect health, people, and parks; managers around the world will benefit from a better understanding of how visitors’ wellness motives affect their connections with PA auditory environments. Such an understanding can inform the development of soundscape management protocols, and the management of protected area settings to maximize the potential health and wellness benefits of PA visitation. The results of this study suggest that incorporating visitors’ wellness motivations into soundscape and other perception-based research may assist efforts to further HPHHP objectives and mandates. Further exploration is needed to determine how soundscape monitoring can best be integrated into visitor use management strategies to achieve the protection of natural resources and the promotion of human health.

The HPHHP research and program concepts merit consideration within Chilean PAs. Numerous policy and management implications have been discussed in this paper, resulting from the implementation of visitor research examining motivations, experiences, perceptions, and well-being within Chilean PAs. Specifically, results indicate that time spent within the acoustic contexts of the CNR may support many Chilean visitors’ wellness needs and help strengthen their desire to visit more. Although more research is warranted, HPHHP principles of reconnecting people and nature through parks seem to interconnect with some of the same contemporary Buen Vivir manifestations that are threatened by increasingly urbanized lifestyles.

Funding

This research was supported by the Chilean National Investigation and Development Agency (ANID) under the ANID Regional Program R17A10002.

References


Elliott, R., & Timulak, L. (2005). Descriptive and interpretive approaches to qualitative research. In J. Miles & P. Gilbert (Eds.), *A handbook of research methods in clinical and health psychology* (pp. 147–159). Oxford University Press.


