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EXPLORING THE RELATIONSHIP BETWEEN NATURE CONNECTEDNESS AND
BELONGING WITH PRO-ENVIRONMENTAL BEHAVIOR
IN BRAZILIAN NATIONAL PARKS.

By

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Dissertation

presented in partial fulfillment of the requirements for the degree of

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ABSTRACT

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Forest and Conservation Sciences

Exploring the relationship between nature connectedness and belonging with pro-environmental behavior in Brazilian national parks.

Chairperson: Wayne A. Freimund, Ph.D.

Park managers in Brazil have recently understood the power of recreational experiences to stimulate a relationship with nature and commitment to its conservation. In their discourse, the central supposition is that those connected to nature and feeling a sense of belonging to nature tend to be more mindful of the environment and more supportive of nature conservation. However, providing visitation opportunities that effectively facilitate visitor experiences in nature has been a managers' lonely endeavor dependent on their skills and beliefs about visitation and no clear visitation policy. Therefore, this study aimed at providing a theoretical base and empirically tested frameworks to collaborate with their efforts.

A visitor relationship with nature was explored by examining two constructs: nature connectedness and nature belongingness. This research contends that an outdoor experience in a protected area strengthens that relationship and stimulates intentions to behave pro-environmentally. In this study, pro-environment behavior intentions were measured as general conservation behavior intentions (related to everyday life) and park-specific conservation behaviors. The study used a mixed-methods approach, and data were collected at Serra dos Órgãos National Park, a Brazilian protected area in Rio de Janeiro, Brazil, in July and August 2018. The quantitative section used a pretest-posttest design. Pre-visit and post-visit surveys were applied to the same Parnaso's visitors to measure the impact of an experience in the park on their relationship with nature. The qualitative phase was completed using two different methods of data collection: an open-ended questionnaire applied during the experience in the park using the Experience Sampling Method and a follow-up interview one week after the trip, applied to a subsample of participants.

Results demonstrated that both connectedness and belongingness positively influence intentions to behave pro-environmentally and that those intentions significantly improved after the park experience. Moreover, those who frequently visit protected areas tend to have more intentions to act pro-environmentally than those who do not. Results also showed that most participants acknowledged that each experience in a protected area strengthens their relationship with nature. The aspects of the experience considered most important to strengthen connectedness and belongingness were the excellent Parnaso's conservation status, the welcoming and friendly environment, and the availability and diversity of activities and services to support visitation. Those aspects allowed visitors to have more profound experiences, feel immersed in nature, and have a sense of wellbeing they could only feel in that kind of environment. Status of conservation and support for visitation helped participants pay attention to the park's nature, interact with it, and learn from it, opening space to a greater awareness of the person-nature relationship. Participants realized and valorized that the park was fulfilling its mission by protecting a natural heritage that belongs to everyone, allowing people to experience that conserved environment by organizing the structures and staff to welcome visitors.

Those results are highly illustrative of the importance of visitation to stimulate visitor's support for conservation and may inspire Brazilian protected area agencies and managers.

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TABLE OF CONTENTS

ABSTRACT	ii
ACKNOWLEDGEMENTS	iii
LIST OF FIGURES	vi
LIST OF TABLES	vii
CHAPTER I - INTRODUCTION	1
Problem Statement	5
Purpose Statement	6
Dissertation Structure	7
CHAPTER II - LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK	8
Nature Connectedness	8
<i>Relationship between Nature Connectedness and Pro-Environment Behaviors</i>	9
<i>Nature Connectedness Measurement Tool</i>	10
Sense of Belonging	11
<i>Nature Belongingness</i>	13
<i>Nature Belongingness Measurement Tool</i>	15
Relationship Between Connectedness and Belongingness	17
Pro-Environment Behaviors	18
<i>Pro-Environment Behavior Intentions Measurement Tool</i>	22
Outdoor Experience Conceptualization	24
Understanding outdoor recreational experiences using the Experience Sampling Method	25
Conceptual Framework and Guiding Questions	27
CHAPTER III - RESEARCH METHODS	29
Study Site	29
Paradigmatic Approach and Research Design	31
Study Population and Sampling Procedure	33
The Quantitative Phase of the Study	35
The Qualitative Phase of the Study	40
Data Analysis Procedures	46
<i>Quantitative Data Analysis</i>	46
<i>Qualitative Data Analysis</i>	56
CHAPTER IV - RESULTS	58
Quantitative Results	58
<i>Sample and Subsample Sizes</i>	58
<i>Sample Characteristics</i>	59
<i>Reliability of the Measurement Scales</i>	60
<i>Factor Analysis – Testing the Measurement Models</i>	62

<i>Descriptive Statistics of the Measurement Scales</i>	69
<i>Comparing the Means of Total Scores Considering Pre and Post-Survey Data</i>	74
<i>ANOVA tests</i>	79
<i>Testing the Overall Measurement Model</i>	88
<i>Testing the Relationship between NC, NB, and PEBI using multiple regression</i>	92
Qualitative Results	96
<i>ESM Data Analysis</i>	96
<i>Phone In-depth Interviews (Follow-up Interviews)</i>	107
CHAPTER V – DISCUSSION, LIMITATIONS OF THE STUDY DESIGN, MANAGERIAL RECCOMENDATIONS, FUTURE RESEARCH, AND CONCLUSION	138
Discussion	138
Limitations	162
Managerial Recommendations	164
Future Research	172
Conclusion	174
REFERENCES	176
APPENDICES	
Appendix 1: Pre-experience survey, applied before participants entered the park	194
Appendix 2: Post-experience survey, applied before participants left the par	199
Appendix 3: Testing the overall measurement model using pre-experience data and AMOS	203
Appendix 4: ESM data table	213
Appendix 5: Phone interview data table	227

LIST OF FIGURES

Figure 1: Theory of Planned Behavior.....	22
Figure 2: Conceptual Framework.....	27
Figure 3: Serra dos Órgãos National Park Landscapes, Activities and Logo.....	29
Figure 4: This study's mixed methods approach.....	32
Figure 5: Thank-you gift offered to participants who completed the pre and post surveys and the ESM questionnaire, and the numbered wristband used to identify participants.....	34
Figure 6: Parnaso's main gates and the most famous park's trail.....	35
Figure 7: WhasApp text message sent to participants.....	45
Figure 8: CFA results for the overall measurement model.....	91

LIST OF TABLES

Table 1: Measurement scales and scales' item codes.....	40
Table 2: The interview guide.....	45
Table 3: Final sample and subsamples sizes after data cleaning considering all phases of the study.....	59
Table 4: Reliability estimates for the measurement scales.....	61
Table 5: Results on KMO and Bartlett's Test of Sphericity for the three constructs of the study.....	63
Table 6: Factor loadings and fit indexes for the three measurement models.....	67
Table 7: Descriptive statistics for the scales' items based on pre-experience survey data and post-experience survey data	69
Table 8: Descriptive statistics for the measurement scales.....	71
Table 9: Number of participants per subsample.....	76
Table 10: Descriptive statistics of the PEBI subsamples.....	78
Table 11: ANOVA results - statistically significant differences between PEBI means for the independent groups/variables.....	80
Table 12: ANOVA results - statistically significant differences between differences in PEBI scores (post-experience minus pre-experience scores) for the independent groups/variables.....	80
Table 13: Descriptive stats for PEBI scores and results of the post hoc comparisons for Q8, Q9, and Q14.....	82
Table 14: Descriptive stats for PEBI scores and results of the post hoc comparisons for Q10 and Q28.....	83
Table 15: ANOVA results - statistically significant differences between NC and NB means for the independent groups/variables.....	84
Table 16: Descriptive stats for NC scores and results of the post hoc comparisons for Q5, Q8, Q9, and Q14.....	85
Table 17: Descriptive stats for NB scores and results of the post hoc comparisons for Q5, Q8, Q9, and Q14.....	87
Table 18: Paired t-test results for specific items of the PEBI scale.....	88
Table 19: Fit indexes for the overall measurement model using pre-survey data.....	89
Table 20: Correlation between constructs, squared correlations, and AVE.	90
Table 21. Regression table of the association between NC, PEBI, and the covariates Q5, Q7, Q9, Q10, Q14, and Q16, using pre-experience data	93
Table 22. Regression table of the association between NB, PEBI, and the covariates Q5, Q7, Q9, Q10, Q14, and Q16, using pre-experience data	95
Table 23: Number of participants per group and ESM questionnaires answered.....	98

CHAPTER I

INTRODUCTION

A significant part of the tropical forests and the world's biodiversity lies in Brazil (Vale et al., 2021), which holds more than 20% of the world's species in six terrestrial biomes and three large marine ecosystems (MMA, 2020). The terrestrial ecosystems store immense amounts of carbon and contain 12% of the global water resources (Levis et al., 2020). In fact, Brazil has an immense global responsibility and plays a crucial role in climate stability at the national, regional, and global levels (Fernandes et al., 2017); the country contains the largest portion of the Amazon rainforest, a critical element to stabilizing the Earth's climate system (Imazon, 2018; Levis et al., 2020).

Part of the Brazilian natural asset is protected by law under the Brazilian system of protected areas, which plays a vital role in preventing biodiversity loss and habitat degradation. However, in Brazil, protected areas have been facing all kinds of pressures, from illegal deforestation to interest groups' pressure to reduce their size and conservation status (WWF-Brasil, 2018; Levis et al., 2020; Vale et al., 2021). In the meantime, for most Brazilians, the natural environment is considered important, but it is perceived as distant from their day-to-day life (WWF-Brasil, 2018). When asked, they seem to understand the importance of protected areas, although they claim to have only vague notions about their contribution to nature conservation (Imazon, 2018). That is why in Brazil, support for nature conservation has been dependent primarily on a narrow group of outdoor enthusiasts, researchers, and environmentalists. Therefore, there is a need to expand that constituency to include people who have no direct relation to the area of conservation (Imazon, 2018), making Brazilians understand that the conservation of protected areas requires society's support and stewardship to succeed.

The support from ordinary people for nature conservation has proven increasingly strategic. However, understanding conservation issues is based on concepts that are sometimes difficult for civil society to comprehend. Perhaps more important than understanding nature is to feel the importance of nature in their lives because, typically, people want to protect what is meaningful to them and their wellbeing (Junot et al., 2017).

A growing body of research has demonstrated that exposure to and interactions with nature bring a whole set of physical and psychological health benefits and a consequent sense of wellbeing (Mayer et al., 2009; Maller et al., 2010; Brymer et al., 2010; Hansen-Ketchum, 2010; Nisbet et al., 2011; Restall, 2011; Cervinka et al., 2012; Zylstra et al., 2014; Tang et al., 2015; Rice et al., 2020). Those benefits include increases in positive states such as affection, social contact, cognitive capacity, encouragement to exercise, and a sense of purpose. Nature exposure can also decrease adverse conditions, such as stress and attention fatigue, aggression, anxiety, and depression. In the present study, exposure to nature and interactions with outdoor habitats are being called experiences in nature.

There are many ways of understanding the word experience. According to Ewert et al. (2009), experiences can prompt "feelings of freedom, sense of harmony or union with some higher power, absorption at the moment, or a sense of overcoming limits or barriers associated with an individual's life" (p. 140). In protected areas studies, experiencing nature is undoubtedly linked to visitation and outdoor recreation and can lead to personal changes, either behaviorally, psychologically, or emotionally (Canadian Parks Council, 2014; Rice et al. 2020). Protected area managers have been challenged to guide those changes to favor the natural environment at the point of encouraging visitors' stewardship and modifying behaviors to those more environmentally responsible.

Zaradic and Pergams (2013) pointed out that spending sustained time in nature brings positive outcomes for people because they feel associated with something greater than themselves. In this sense, one could say that nature has transformative power (Swaisgood & Shepard, 2011) since people become different "when they stretch out of themselves" (Zylstra et al., 2014, p.133) and value nature. That feeling can make people act more responsibly to conserve nature (Nisbet et al., 2009; Cervinka et al., 2011), triggering a sense of environmental obligation on everyday life practice (Schultz, 2000; Mayer & Frantz, 2004; Zelenski & Nisbet, 2014).

In this context, parks and other protected areas are excellent places for people to feel all of nature's powerful benefits (Canadian Parks Council, 2014) since they can help establish a human-nature relationship that could foster long-term conservation support. Besides Zaradic and Pergams (2013), other studies (Nisbet et al., 2009; Maller et al., 2010; Balmford & Cowling, 2006) have found that a positive human-nature relationship has practical outcomes for conserving protected areas. Those studies affirm that contact with nature may foster an ethic that motivates people to become more engaged citizens and take responsibility for those protected environments. However, Restall and Conrad (2015) pointed out that more effort is needed towards multi-disciplinary research to understand how to stimulate a relationship with nature that changes environmental behaviors into those more responsible.

The present study intends to provide insight into the influence of a person's recreational experience in a protected area on his/her relationship with nature, represented in this study by two constructs: nature connectedness (NC) and nature belongingness (NB). Based on previous studies (Jones et al., 2000; Crisp, 2010; Mahar et al., 2013; Brown, 2016), it is hypothesized that NC and NB represent distinct aspects of a person's relationship to nature. Those constructs are

explored to understand their influence on visitors' intentions to behave pro-environmentally, which is measured considering broad nature conservation support and park-specific support.

In contrast to many studies conducted on NC, its measurement scales, and its relationship with pro-environment behavioral intentions (PEBI), there is little research to explore NB. Moreover, those few studies have not proposed a scale to measure that construct, nor have they studied its relationship with PEBI. The present study intends to fill that gap by exploring NB and operationalizing it, which are pivotal contributions of this research.

It is important to highlight that this is a Brazil-centered study. Although Brazil is highly developed and sometimes revolutionary concerning environmental and protected area laws, the country is more similar to the vast number of developing countries regarding protected area management and especially visitation. Funding, human resources, and capacity building for visitation are the bottlenecks mostly because of the lack of support and prioritization from the governments in charge. Therefore, it makes sense to offer to Brazilian managers contribution to the understanding of the park experience, its influence on visitors' relationship with nature and intentions to behave pro-environmentally. The metrics and frameworks used in this study, although highly researched and tested in the U.S.A. and other developed countries with historical contributions to the management of visitation in protected areas, are still unknown or hardly used in Brazil. Thus, the results may help conservation agencies and park managers, not only in Brazil but in countries that face the same challenges, to effectively use their sparse resources to offer experiences that improve visitor-nature relationships and consequently motivate conservation commitment.

PROBLEM STATEMENT

Appreciation of nature is usually a consequence of previous and positive experiences in the natural environment, potentially leading to changes in personal values and attitudes in favor of nature conservation (Manfredo, 2008). In this context, protected areas play an essential role in providing outdoor recreation opportunities, stimulating and strengthening personal relationships with nature (Nisbet et al., 2009).

In Brazil, the experience of protected areas is largely lacking among civil society. Comparing the annual number of visitors to protected areas in the USA and Brazil makes it easier to understand Brazilian protected areas' visitation dimension. In 2019, there were 327,516,619 recreation visitors in the US National Park System, from 379 reporting units, with approximately 83% being national/domestic visitors (National Park Service, 2020). That means there were around 988 visits/1000 inhabitants in the US (considering the total number of 331,2 million inhabitants in the US in 2019, according to the United States Census Bureau), while in the same year in Brazil, there were 15,335,273 visitors in 334 federal areas, or about 73 visits to protected areas/1000 inhabitants (ICMBio, 2020), almost 14 times less.

The lack of direct experience helps perpetuate a cycle of disconnection from nature, leading to a lack of support for conservation and a loss of human benefit (Junot et al., 2017; Lumber et al., 2017). If it is true that positive relationships between people and nature moderate people's support for nature conservation and that the experience in a protected area can play an essential role in improving people-nature relationships (Adams, 2006; Williams, 2007; Zaradic & Pergams, 2009; Russel & Russel, 2010; Perkins, 2010), then there is a need to understand the theoretical basis on which those statements rest to help parks offer recreation opportunities that effectively stimulate those relationships and support.

However, in Brazil, visitation to protected areas has been historically seen as less significant than other protected area management actions, such as protection (Burns & Moreira, 2013; Viveiros de Castro, 2018). For many years, visitors were not welcome, and visitation was an extra and inessential activity that should be implemented after all the other management programs were performing well. Because of those beliefs, only 38 of 72 Brazilian National Parks record visitor numbers, and few parks offer adequate infrastructure for public use (Souza et al., 2018). Furthermore, the attempts to qualify visitation opportunities in Brazil has not been a governmental strategy but an individual enterprise dependent on park managers' skills and their beliefs on the importance of visitation to connect people to nature. Additionally, most park managers in Brazil lack visitor use management experience and empirically tested frameworks to guide their attempts to effectively offer memorable visitor experiences. Thus, it is important to provide a theoretical basis on the human-nature relationship and the relationship between nature experiences, attachments to nature, and public support for nature conservation to direct managers' limited resources to improve visitors' experiences.

PURPOSE OF THE STUDY

Conservation policymakers and protected areas managers in Brazil are starting to understand the power of recreational experiences in protected areas to stimulate Brazilians' relationship with nature and commitment to conservation. In their discourse, the central supposition is that those connected to nature and feeling a sense of belonging to nature tend to be more mindful of the environment and more supportive of nature conservation. To verify that supposition and offer managers a theoretical basis and tested frameworks, this study:

- Provide a further understanding of NB and a scale to measure that construct.
- Test a reliable and valid NC scale in the Brazilian context of visitors to a national park.

- Assess the impact of a recreational experience in a Brazilian national park on NC, NB, and PEBI, together with the relationship between those constructs.

DISSERTATION STRUCTURE

This dissertation is structured in a traditional academic format and encompasses five chapters, including this Introduction. The second chapter, Literature Review and Conceptual Framework, provides an overview of current knowledge and relevant theories about the topics on which this study is based, shedding light on the existing research gaps. This study's conceptual framework is then proposed, illustrating the relationships hypothesized between the three constructs being studied (NC, NB, and PEBI). The third chapter, Methods, explains the study site, the sample, and the methodological approach used in this research. In Chapter 4, Analysis, quantitative and qualitative data are reported and analyzed. The findings are used to answer the research questions and to gain in-depth insight into the constructs used. The recreational experience in a Brazilian national park is also analyzed based on participants' views and feelings. A concluding chapter includes the Discussion and Conclusion, putting together this study's contributions and a critique of the literature reviewed and embodying the managerial recommendations derived from the analyses. This last chapter also brings the limitations of the adopted research design, including issues observed during the fieldwork and future research suggestions.

CHAPTER II

LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK

The human-nature relationship has been largely studied in deep ecology, environmental ethics, ecopsychology, and sociology, among others (Restall & Conrad, 2015), advancing the theory on constructs that represent that relationship. This chapter provides a review of past research on the constructs used in this study to define a human-nature relationship - nature connectedness and nature belongingness – and their influence on people’s environmentally responsible behavior intentions. The conceptual framework organizes hypothesized relationships between those constructs, potentially improved by a recreational experience in a protected area.

The chapter also offers a review of research that guided the development of this study’s research instruments, which were used to understand and measure the influence of a recreational experience in a Brazilian national park on visitor levels of connectedness, belongingness, and intentions to behave pro-environmentally.

NATURE CONNECTEDNESS

The literature reports a diversity of terms and some overlap on the concepts representing a human connection with nature (Tam, 2013; Restall & Conrad, 2015). Some concepts are unidimensional, and others are considered multidimensional. However, most authors agree that a personal connection with nature consists of at least one of the following dimensions: the cognitive dimension, meaning the knowledge and beliefs about nature; the affective dimension, i.e., emotions and feelings about nature; and the experiential dimension represented by past, present, and future interactions with nature and behaviors towards the natural world (Chawla, 1998; Kals et al., 1999; Schultz, 2001; Schultz, 2002; Opatow & Clayton, 2003; Mayer & Frantz, 2004; Dutcher et al., 2005; Nisbet et al., 2009; Perkins, 2010; Brugger et al., 2011; Cheng & Monroe, 2012; Tam, 2013; Zylstra et al., 2014).

Zylstra et al. (2014) conducted an interdisciplinary review on nature connectedness research. They developed a definition used in this study, highlighting the three critical dimensions of connectedness that interrelate and influence each other. For the authors, connectedness with nature is "a stable state of consciousness comprising symbiotic cognitive, affective, and experiential traits that reflect, through consistent attitudes and behaviors, sustained awareness of the interrelatedness between one's self and the rest of nature" (p. 199). These traits reflect the extent to which an individual: a) includes nature within his/her cognitive representation of the self (Schultz, 2002); b) demonstrates positive feelings and emotions towards nature, which includes a clear recognition of nature's intrinsic value (Perkins, 2010); c) and behaves, over time, to protect nature. The process of building connectedness comprises the information received, having an experience, being affected by the experience, and building connectedness, which, over time, may stimulate commitment (Zylstra et al., 2014).

Nature connectedness reflects a sustained awareness of the interrelatedness between the self and the rest of nature; it is not a superficial enjoyment of nature but, instead, an enduring appreciation of its intrinsic value. Nature connectedness transcends hedonism and utilitarianism and manifests as a commitment to conserving nature (Zylstra et al., 2014). As stated by Dutcher et al. (2005), "lack of connectivity with nature amounts to alienation from nature and manifests itself in a dominating perspective." (p. 478).

Relationship between Nature Connectedness and Pro-Environment Behaviors

According to Kaplan (2000), people are more motivated to comply with environmentally responsible behaviors when they develop a relationship with nature. Following Kaplan's reasoning, a number of studies (Hartig et. al., 2001; Mayer & Frantz, 2004; Dutcher et al., 2005; Hinds & Sparks, 2008; Hoot & Friedman, 2011; Zelenski & Nisbet, 2014; Rogers & Bragg,

2012; Tam, 2013; Lin et al., 2014; Zylstra et al., 2014) have demonstrated nature connectedness to be a reliable predictor and motivation for pro-environmental behaviors.

Nisbet et al.'s (2009) and Schultz (2011) studies provided evidence that people with higher levels of nature connectedness report more environmental concern, endorsement of pro-environmental attitudes, and also self-reported environmental behaviors, which in turn would influence social norms and collective action. As such, nature connectedness has been considered a core conservation concern since it is found to be the bedrock to effective conservation practices. It should, therefore, be stimulated and prioritized in recreational, educational, and political strategies (Zylstra et al., 2014).

Nature Connectedness Measurement Tool

Several measurement scales have been proposed and tested to reliably assess a person's self-reported connection with nature (Kals et al., 1999; Schultz, 2002; Opatow & Clayton, 2003; Mayer & Frantz, 2004; Dutcher et al., 2007; Davis et al., 2009; Nisbet et al., 2009; Perkins, 2010; Brugger et al., 2011; Cheng & Monroe, 2012; Silvas, 2013; Martin & Czellar, 2017). Tam (2013) analyzed some of those NC scales, some unidimensional and others multidimensional, and concluded that the multidimensional concepts consistently had better performance.

The scale which has been most empirically tested is the Nature Relatedness Scale (NRS) by Nisbet et al. (2009), which describes individual levels of connectedness with the natural world by assessing the affective, cognitive, and physical relationship individuals have with nature. This 21-item scale assesses the following dimensions: NR-Self, which represents an internalized identification with nature, reflecting feelings and thoughts about one's connection to nature; NR-Perspective, which represents a person's perspective on human rights and responsibilities related to nature and individual human actions and their impact on nature; and NR-Experience, which

assesses the person's past experiences in nature, the physical familiarity with the natural world, and the level of comfort with and desire to be out in nature. The authors affirm that Nature Relatedness correlates with environmental scales, pro-environmental attitudes, and frequency of time spent in nature, supporting the construct's reliability and validity. Howell et al. (2011), Nisbet et al. (2011), Tam (2013), Beery et al. (2014), and Restall and Conrad (2015) reported that the scale items are highly internally consistent, and that the NR scale is important in predicting self-reported ecological behavior and subjective wellbeing.

A short version of the 21-item NRS developed by Nisbet and Zelenski (2013) comprises six items from the “self” and “experience” dimensions. This short scale is used in the present study to measure a person’s nature connectedness because it has advantages over the full version when one considers the time necessary to its application and cost constraints. The authors tested the short scale’s predictive ability across multiple samples and with longitudinal data. The 6-item scale demonstrated good internal consistency and temporal stability. It can be mainly used when the research aims to analyze the connectedness elements presented in the self and experience dimensions rather than the perspective dimension, which is the case of the present study. Elements of the perspective dimension (human responsibilities related to nature) are of interest in the present study; they are measured by a pro-environmental behavior intentions scale developed in this study, detailed in the text.

SENSE OF BELONGING

To explain nature belongingness, it is necessary to start with a broader construct: sense of belonging. As Yuval-Davis (2006) stated: “People can ‘belong’ in many different ways and to many different objects of attachments. These can vary from a particular person to the whole of

humanity, in a concrete or abstract way; belonging can be an act of self-identification or identification by others, in a stable, contested or transient way.” (p. 199)

Sense of belonging is a complex construct that has been largely studied in the fields of psychology (and its subfields), sociology, and health care (Malone et al., 2012). The majority of those studies focus on social relationships that go beyond a mere desire to affiliate or socialize to a desire to be accepted and belong to social groups (Leary et al., 2013). In those studies, sense of belonging was explored as an explanatory construct using two research approaches: the positive consequences of belonging, and the negative consequences of not belonging for the individual; and the wider implications of belongingness for communities and societies (Levett-Jones et al., 2007).

From the psychology field, Anant (1967, p. 21) stated that sense of belonging is “a sense of personal involvement in a social system so that persons feel themselves to be an indispensable and integral part of the system.” Hagerty et al. (1992) added to Anant’s definition, arguing that sense of belonging is the experience of personal involvement in a system (relationship or organization) or environment (natural or cultural) so that people feel as an integral part of that system or environment. To the authors, the construct has two conceptual domains: "valued involvement" (the feeling of being valued, accepted, respected, needed), and "fit" (when a person perceives that his or her characteristics fit or complement the system or environment).

Baumeister and Leary (1995) coined the term “Need to Belong” to describe the human drive or necessity to form close attachments. They developed the Belongingness Hypothesis that states that human beings have “a pervasive drive to form and maintain at least a minimum quantity of lasting, positive, and significant interpersonal relationships” (p. 497). The importance of sense of belonging in understanding human behavior has been highlighted by many other

researchers, who claim that belongingness is a fundamental motivation (Levett-Jones et al., 2007; Leary et al., 2013). That means that sense of belonging is a need, and not a want (Baumeister & Leary, 1995). As such, it has positive effects on humans' health or wellbeing when it is satisfied, or it can lead to pathologies for those people who lack belongingness.

Although the belongingness construct has been most studied in the realm of social systems and personal relationships (Peters et al., 2016), more recently ecopsychology studies on belongingness have broadened the scope to address the relationship people build with nature. A sense of belonging to nature is both the reason and the consequence of expanding our sense of self in order to include the natural world and all living things so that behaviors that would lead to a degradation of the natural world would be experienced as self-destruction (Kunchambo, 2017).

The present study expands what is already known about a sense of belonging to understand the role of that construct in the human-nature relationship. Extending Baumeister and Leary's Belongingness Hypothesis, one can say that human beings have a pervasive drive to form positive relationships with nature, which turns feelings of nature belongingness into an original and effective path to wellbeing. When people are in nature and meet their need to belong, they experience psychological and physical benefits (Baumeister & Leary, 1995; Levett-Jones et al. 2007; Mellor et al., 2008; Nichols & Webster, 2013).

NATURE BELONGINGNESS

The sense of belonging in the context of recreational landscapes was first examined by Jones et al. (2000). The authors defined belongingness as a sense of familiarity, or the sense of feeling at home in a specific landscape, characterized by an atmosphere of friendliness, closeness, and freedom to be. In the perspective of the authors, a sense of belonging is based and

formed as a result of significant experiences, and manifests through affective bonds to landscapes.

According to Zaradic and Pergams (2013), Lambert et al. (2013), and Kumchambo et al. (2017), spending time in nature satisfies individual needs for multisensory interactions and feeds our sense of belonging to a greater context beyond self. Therefore, nature belongingness can be understood as a subjective experience that initiates a person's sense of fitting in and feeling a part of a larger symbolic entity that transcends the limitations of his/her own body. NB is essentially a psychological construct that emphasizes both the value and perceived fit that individuals feel in their interactions with the natural environment (Mahar et al., 2013).

It is important to differentiate belongingness of other concepts that are related to affective bonds to landscapes, such as sense of place, which have been largely studied. People form complex relationships with significant places in their lives, whether their homes, their communities, or where they recreate (Tuan, 1975; Farnum et al., 2005; Halpenny, 2006; Jorgensen & Stedman, 2006; Dickinson, 2011; Buta et al., 2014). A sense of place is the most encompassing term that characterizes the positive bonds between people and their important places (Farnum et al., 2005; Scannell and Gifford, 2010), and includes emotional, symbolic, and even spiritual meanings that are established through experiences and memories in a place (Williams, 2008). A sense of place implies assigning significance to specific geographic locations which have limited external boundaries (Tuan, 1980; Williams, 1993; Jones et al., 2000), while belonging describes the feelings a person holds for a type of landscape or environment and refers to the boundaries of the bond within the individual, sometimes in an unself-conscious way. Therefore, a person may feel an attachment to a specific national park

where she/he has visited since childhood and may feel a sense of belonging to any landscapes or environment that resembles that protected area (Jones et al., 2000).

Brown (2016) studied the importance of belonging in the context of outdoor recreation. She explored mountain bikers' experiences at Cairngorms National Park in Scotland, and the disjuncture between promotion and provision of facilities, contending that mountain bikers were not always welcome on the ground by managers and other users. She argued that protected area managers can increase visitor satisfaction through a sense of welcome and belonging by making visitors feel as insiders and not outsiders of those areas. She also showed that inconsistencies in communication with the population (am I invited or am I welcome to visiting a protected area?) and the lack of welcoming can make managers pay a high price, as sense of belonging or lack of it can work to develop positive relationships, indifferent or even destructive relationships in relation to protected areas. The fact that people feel foreign to the natural environment and do not feel welcome in that environment can generate a " disengagement threshold " (p. 35) and disconnection. Therefore, the author highlights belonging as a visitation management mechanism that is important, but under-acknowledged and underused by park managers. The belongingness attributes - being welcomed, valued, and fitting in - might help park managers to understand what grounds the subjective perceptions of belongingness to nature.

Nature Belongingness Measurement Tool

Researchers rarely studied the sense of belonging concept to understand the human-nature relationship, and, therefore, no studies have developed a reliable measure for nature belongingness so far. Assuming that a potential increase in the feeling of belonging to nature is one of the consequences of recreational experiences in nature, it is important to measure one's sense of belonging to the natural world so that empirical progress can guide management

approaches aimed at evaluating the effectiveness of recreational experiences in improving the human-nature relationship. Paralleling Fernster (2005), Yuval-Davis (2006), and Antonsich (2010), this study acknowledges two major analytical dimensions of belongingness - belonging as a personal, intimate, feeling of being safe, comfortable, and 'at home', and belonging as an official, public-oriented form of membership (politics of belonging) - and focuses on the former intending to produce insights for the latter.

A variety of scales have been developed to measure a sense of belonging, especially in the realm of social relationships. Still, according to Allen et al. (2021), there is little agreement on how belonging should be measured. The authors conducted a narrative review summarizing existing perspectives on belongingness and its measurement tools and suggest a differentiation between state-based belongingness and trait belongingness. A trait-like sense of belonging refers to a core psychological need, while a state-based sense of belonging captures transitory feelings of belonging (Walton & Brady, 2017). Allen et al. (2021) affirm that most belongingness tools assess state-like experiences due to their propensity to measure the person's perception at the time of the survey administration and related to a specific situation.

Of the belongingness scales analyzed by this study (Schreindorfer & Leary, 1996; Jones et al., 2000; Mellor et al., 2008; Malone et al., 2012; Leary et al., 2013; Pillow et al., 2015; Peters et al., 2016), the scale by Jones et al. (2000) brings contribution for the understanding of nature belongingness. The authors tested the sense of belonging to a recreational landscape with visitors in a protected area. They asked respondents to rate statements like "I feel I belong in these scenes" and "I feel at home in this landscape." This study's nature belongingness scale, which is detailed in the Methods section, was based on Jones et al.'s (2000) measurement tool and the main attributes of belongingness. Those attributes were drawn from past studies

definitions on that construct, such as the one by Mahar et al.'s (2013), and are: feeling needed, important, integral, valued, respected, and feeling in harmony with the group or system, together with feelings of being welcome and fitting in an environment. Moreover, the scale is also intended to assess both trait-like and state-based sense of belonging to nature.

RELATIONSHIP BETWEEN CONNECTEDNESS AND BELONGINGNESS

The present study contends that belongingness and connectedness need to be distinguished by those planning and managing recreation in protected areas to stimulate those feelings adequately. Furthermore, consideration of both constructs enables a more nuanced understanding of the human-nature relationship. Crisp (2010) demonstrated that both constructs could co-exist or even exist without the other.

Nature connectedness and nature belongingness are primarily individual experiential processes (internal processes) and can be stimulated due to direct and positive experiences in nature. Both constructs work together to build and strengthen a personal relationship with nature. However, while nature connectedness comprises at least three dimensions (a cognitive, an affective, and an experiential dimensions), belongingness is a subjective experience based primarily on an emotional dimension (Kunchambo et al., 2017).

One of the similarities between constructs is the lack of specificity concerning the object of the relationship. People connected with nature do not link their appreciation to a specific place or landscape. Instead, they refer to the feeling of being connected to broad nature (Colléony et al., 2017). Likewise, belonging relates to the feelings a person holds for types of landscapes or natural environments (Jones et al., 2000). Therefore, a person may feel a sense of belonging to any lake, mountain, or beach that resembles the landscapes where he had significant experiences.

From the studies of Dutcher et al. (2005) and Crisp (2010), one can infer that the concept

of nature connectedness is intrinsically linked to the understanding that people and nature are parts of the same community. Nature as community and nature connectedness involve a sense of nature belongingness, or a sense of being an insider or part of nature, which might stimulate commitment with nature conservation through pro-environmental behaviors. According to Dutcher et al. (2005), "people who sense a fundamental sameness between themselves and the natural world will feel more empathetic and compassionate toward nature" (p. 478).

PRO-ENVIRONMENT BEHAVIORS

Pro-environment behavior (PEB) is the third construct used in the present study. It reflects a human-nature relationship based on the commitment a person has to conserve the natural environment. PEB was defined by Steg and Vlek (2009) and Larson et al. (2015) as a range of behaviors that benefit the environment, enhance the quality of the environment, or harm it as little as possible. Such definition is followed by the present study.

The role of individual behaviors as key factors for the preservation of the environment has been widely studied by researchers from many disciplines, such as social psychology, conservation psychology, sociology, and human dimensions (Levy-leboyer et al., 1996; Clayton and Saunders, 2012). Research is, therefore, of growing importance to identify the factors that decisively affect these behaviors and if these factors are characteristics of particular groups or contexts.

Behaviors that affect the environment have been investigated from two perspectives: "impact-oriented" and "intent-oriented" (Park & Ha, 2012). According to Stern (2000), environmentally significant behaviors can be defined by their impact as the extent to which those behaviors "change the availability of materials or energy from the environment or alter the structure and dynamics of ecosystems or the biosphere" (p. 408). This perspective implies a

broad analysis of environmental issues and related causes, which can be direct (like household waste disposal) or indirect causes (like international and national environmental policies).

Steg et al. (2014) also define environmental behavior by its impact, as any action that affects the quality of the environment, in either a positive or negative way. The impact-oriented perspective has been the most studied perspective among scholars because of the complexity and scale of environmental problems which demand broad and large-scale actions, such as policy changes or advances in technology. However, over the past years, the intent-oriented perspective, which focuses on individual decision making, has attracted researchers' attention, considering the importance of linking individual behaviors to positive and negative environmental impacts, and the realization that personal values, beliefs, and behaviors are important to drive environmental conservation.

Intent-oriented behavior is defined from the individual's standpoint as behavior that is undertaken with the intention to change the environment (Stern, 2000). Following this reasoning, one can tell that intent-oriented PEBs are primarily driven by attitudinal variables, while the impact-oriented PEBs are mostly driven by sociodemographic and structural variables (Gatersleben et al., 2002). There are, therefore, important differences between those two perspectives of PEB.

The present study is focusing on the intent-oriented perspective of PEB, since the main interest has to do with visitors' intentions of performing behaviors that would benefit the environment.

In fact, individuals have demonstrated a growing interest in understanding environmental issues and their causes, maybe as a consequence of global warming and other facts that harm people's quality of life (Schultz, 2000). However, despite the growing interest, most people fail

to make choices that benefit the environment or at least minimize negative environmental impacts (Whitmarsh, 2009; Halpenny, 2010). That fact may have to do with financial or time constraints, lack of information or lack of a political system to stimulate positive and proactive actions, and more important, personal (internal) factors such as values and belief systems. However, individuals need to understand that they have personal and shared responsibilities regarding environmental conservation.

PEB is a complex construct and has been approached differently by different authors (Larson et al. 2015). Types of PEB vary greatly considering direct or indirect outcomes (Stern, 2000; Poortinga et al., 2004; Larson et al., 2015), and the range of influence, from local to global (Halpenny, 2010; Ramkissoon et al., 2012). Concerning the categories of PEB, Ajzen & Fishbein (1977) were followed by Verhallen and Pieters (1984) and Thøgersen and Ölander (2003, 2006) in their definition of behavior categories. In their perspective, categories of PEB refer to a set of single acts that are similar in at least one of the following elements: the action; the target at which the action is directed; the context in which the action is to be performed; and the point in time when the action is performed. Categories are, therefore, clusters of behaviors that reflect the same underlying disposition.

The PEB categorization by Larson et al. (2015), which was based on the study by Stern (2000), was the one used in the present study. Stern's perspective was also followed by Poortinga et al. (2004), Homburg and Stolberg (2006), Steg and Vlek (2009), and Sawitri et al. (2015). The first category encompasses behaviors in the *private sphere*, called by Larson et al. (2015) as “conservation lifestyle behaviors”, which have direct consequences on the local environment. Examples of those behaviors are the purchase and use of household goods and services (automobiles, energy for the home), green consumerism (organic and local food), and

disposal of personal and household products (recycling, waste reduction, etc.). Although the positive environmental impact of an individual performing this category of PEB is small, if those behaviors were widely spread in the general population, they would produce greater and more important impact on the environment.

The second and third categories of PEBs are related to civic engagement (Stern, 2000) from the viewpoint of environmental activists and non-activists and refer to actions in the socio-political arena. Larson et al. (2015) named these categories as *social environmentalism*, which is the active involvement in environmental organizations and demonstrations, and *environmental citizenship*, which includes contributing to environmental organizations, petitioning on environmental issues, or supporting public environmental policies. Those two categories of PEBs have indirect environmental consequences by, for example, influencing public policies. However, the effects may be larger than the direct class of behaviors, since public policies reach many people and organizations at the same time.

The fourth PEB category suggested by Larson et al. (2015), *land stewardship*, encompasses conservation-oriented actions that have direct and local impacts by improving the ecological features of a particular place (for example, restoring degraded natural areas or wildlife habitats) or participating in conservation actions to protect national parks and other protected areas.

This study used the PEB categorization offered by Larson et al. (2015) as a basis to develop a measurement tool for the intentions to perform PEB and paralleled the study by Halpenny (2010) concerning the types of behavior intentions to perform (site-specific or general behaviors), as explained below.

Pro-environment behavior intentions measurement tool

A 2013 review of empirical research on PEB as a dependent variable revealed 49 studies, and of those, 42 presented different measures of PEB (Markle, 2013). The review indicated little consistency among the instruments studied and pointed out that there was no standard instrument available to measure pro-environmental behavior. Therefore, this study created a new PEB scale, which was modeled after pre-existing PEB scales (especially those developed by Halpenny, 2010, and Jorgenson & Nickerson, 2016) and tailored to fit the study's objectives and population.

Some of the previous research mentioned above (Halpenny, 2010; Gifford & Sussman, 2012; Sawitri et al., 2015) explained pro-environment behavior using the Theory of Planned Behavior (Ajzen, 1991), which states that the best predictor of a behavior is the intention to perform that behavior, which is, in turn, influenced by favorable attitudes toward the behavior, perceived social norms (perceptions of the norms concerning that behavior), and perceived behavioral control (the individual's perception that that behavior is under his or her control and that behavior will potentially promote the desired goals; Figure 1).

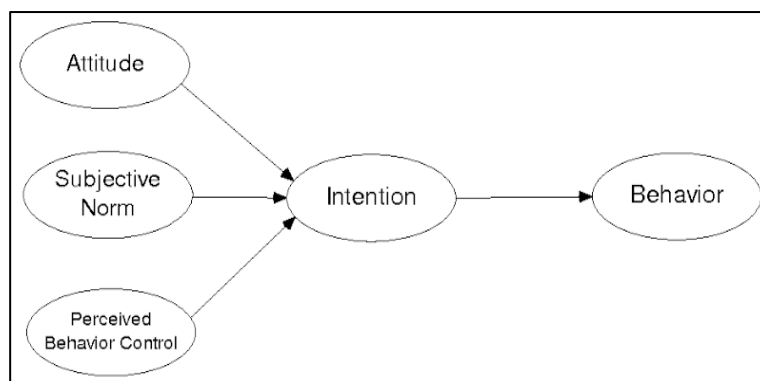


Figure 1: Theory of Planned Behavior (Ajzen, 1991)

Because this study wants to know the effects of outdoor experiences in pro-environment behaviors using a pretest-posttest design, it was necessary to ask visitors about their intentions of

performing the behaviors, since during a single experience it is possible to identify changes in intentions to perform such behaviors but not changes in behaviors themselves.

The operationalization of pro-environment behavior intentions (PEBI) followed the research approach by Jorgenson and Nickerson (2016), who investigated the level of visitor support for Yellowstone national park using a park-support scale. The authors constructed that scale when they realized, after a comprehensive review of the literature, that no prior research had attempted to explore people's support for national parks. For the authors, park support means "direct and indirect actions taken by people that assist in the preservation and livelihood of the ecological and social functions of national parks." (p. 29). Ten variables including indirect and direct measures were rated on a 5-point scale and summated to obtain the level of park support. Direct measures included donating to the Yellowstone Park Foundation and volunteering in Yellowstone, among others. Indirect measures included sharing experiences with others and bringing new visitors to Yellowstone, among others. They found that an engaging and memorable experience in the park tended to lead to a higher level of support by visitors.

The present study also followed Halpenny's approach (2010), which explored the relationship between visitors' attachment to a Canadian national park, Point Pelee National Park, and intentions to perform environmentally responsible behaviors towards the environment in general and intentions that would benefit that specific place of attachment. These two types of pro-environment behavioral intentions (general and site-specific) were used in the present study and each behavior intention was allocated in one of the categories proposed by Larson et al. (2015).

This study's PEBI measurement scale is detailed in the Methods section.

OUTDOOR EXPERIENCE CONCEPTUALIZATION

After defining the three constructs used in this study and their measurement tools, it is important to conceptualize experience. Consistent with other studies (Zaradic & Pergams, 2009; Perkins, 2010), some of this study's hypotheses are based on the power of the experience for stimulating PEBI through nature connectedness and belongingness.

Experiences are dynamic, subjective, unique in their details, unrepeatable, and it is not easy to fully describe them, because sometimes experiences do not fit in words (Morse, 2011). Conscious experience is idiosyncratic, and its primary outcome is *transformation* (Hektner et al., 2007).

Williams (2007) defines outdoor recreation experience through the lenses of environmental psychology. In his perspective, recreation experience is a psychological phenomenon that includes individual cognitive, emotional, and behavioral aspects influenced by environmental conditions and events. The outcomes of an outdoor experience would be immediate emotional reactions and changes in wellbeing that would persist beyond the setting to the individual's daily life.

Early research on visitor experiences in protected areas has made it possible to consolidate knowledge about who visitors are, what they do during their trips, their perceptions, attitudes, preferences, and expectations about the visit (Borrie & Birzell, 2001). Visitor satisfaction based on the quality of the experience has also been the center of attention of researchers. However, outdoor recreation is much more complex and can offer much more information; it is a multifaceted phenomenon compound of emotions, feelings, perceptions, attitudes, and a sense of self (Cole & Williams, 2012). Understanding the relationship between the recreation settings (resources and their characteristics), the experiences, and the personal outcomes related to recreating in those settings can help park managers improve management

practices to qualify the experience, improving visitor satisfaction (Williams, 2007). However, beyond the knowledge of the personal benefits or outcomes people derive from visiting parks, it is vital to research the potential consequences for protected areas from those visits and the outcomes for general environmental conservation (Zaradic & Pergams, 2013; Moyle et al., 2017).

A firsthand encounter with nature in a national park can restore mutual intimacy between people and nature and ownership of their parks through belongingness so that people feel the power of nature in their lives through connectedness (Adams, 2006; Russel & Russel, 2010).

Understanding outdoor recreational experiences using the Experience Sampling Method

How the recreational experience is operationalized depends on the definition adopted and the focus of the research. The experience is a multiphasic construct and is conceptualized by researchers as having dynamic, evolving, transitory, and multidimensional characteristics (McIntyre & Roggenbuck, 1998; Borrie & Roggenbuck, 2001; McKay et al., 2012).

There is a set of dependent variables that have been used to examine and relate the characteristics of the outdoor recreational experience to the outcomes of the experience for people, such as mood, stress levels, fear and enthusiasm, satisfaction, anxiety, excitement, calmness (McKay et al., 2012), and perceived competency and risk (McIntyre & Roggenbuck, 1998). The challenge has been to identify the independent variables, which could be the time spent at a site, the places and the unique characteristics of the areas visited, types of groups and number of people in the group, level of intimacy with outdoor recreation, and so many other possibilities (McKay et al., 2012).

Borrie and Birzell (2001) explained the experience-based approach used in this study to understand visitors' recreational experience. That approach was based on the model of

experience phases proposed by Clawson and Knetsch (1966). According to the authors, there are five experience phases: anticipation, travel-to, onsite, travel back, and recollection. Each phase is important to study the experience and its outcomes, although park managers are usually interested in the onsite phase. The experience-based approach examines the experience as it unfolds by asking visitors to describe it instead of asking them to evaluate the experience's components after the visit (Borrie and Birzell, 2001; Tussyadiah, 2014). To examine the multiphasic nature of the onsite experiences, outdoor recreation researchers have explored different methods (other than the traditional ones, such as the post-experience surveys), including the Experience Sampling Method (ESM). ESM was the method used in this study to operationalize the experience.

ESM has been widely used by researchers in different research areas, especially psychological research, and more recently in tourism and leisure research (Scollon et al., 2003) to operationalize the experience and capture momentary on-site real-time data on a range of individuals' subjective experiences. ESM emerged from a phenomenological standpoint and was developed as an attempt to study experience in the naturally occurring contexts of everyday life (Christensen et al., 2003; Hektner et al., 2007) by capturing contents of consciousness, like thoughts, feelings, and sensations (Pejovic et al., 2016). The method measures "flow" (a psychological state of mind characterized by complete immersion into an activity) as the phenomenon is occurring (McKay et al., 2012; Shoval et al., 2017) and permits the researcher to examine the links between the external context and the contents of the mind (Hektner et al., 2007; Quinlan Cutler et al., 2016). In the case of the present study, ESM offered visitors of a Brazilian national park a way of directly describe what they were living by capturing data based on the immediate experience (closer in time to the event).

CONCEPTUAL FRAMEWORK AND GUIDING QUESTIONS

As stated in the literature review, recreational experiences in natural environments can stimulate and strengthen positive relationships between people and nature and are deemed one of the most critical influences on positive attitudes toward the environment. Considering the context of an experience in nature, a conceptual framework was proposed for this study and is illustrated below.

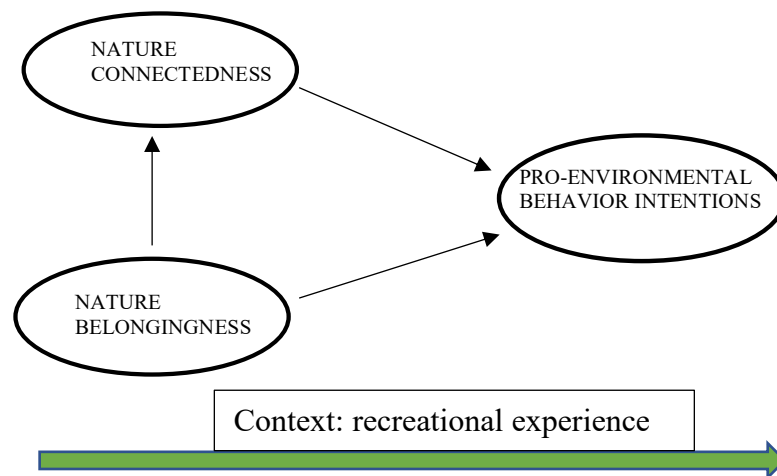


Figure 2: Conceptual Framework

Previous research has demonstrated that nature connectedness is a strong predictor for pro-environment behavior intentions. Then, it was anticipated that that construct has a direct and positive impact on PEBI. Therefore, visitors to a Brazilian national park who were more connected to nature would demonstrate higher levels of PEBI, represented in this study by site-specific PEBI (parks support) and general PEBI. It was also anticipated that nature belongingness has a direct and positive effect in PEBI and also an indirect and positive impact through connectedness. Therefore, visitor's higher levels of nature belongingness would stimulate higher levels of PEBI. Through nature connectedness and nature belongingness, it was

posited that the outdoor recreational experience plays the role of moderator between those two constructs and PEBI. Accordingly, the following research questions guided this study:

- 1) Is there a positive relationship between nature connectedness and PEBI?
- 2) Is there a positive relationship between nature belongingness and PEBI?
- 3) What is the relationship between nature belongingness and nature connectedness?
- 4) Is there a significant increase in the level of visitor's nature connectedness due to a recreation experience in a national park?
- 5) Is there a significant increase in the level of visitor's nature belongingness due to a recreation experience in a national park?
- 6) Is there a significant increase in the level of visitor's PEBI due to a recreation experience in a national park?
- 7) What are the aspects of a recreational experience in a protected area that could stimulate connectedness, belongingness, and PEBI?

CHAPTER III

RESEARCH METHODS

This chapter explains how the research problem was addressed. An overview of the study site and the study population, and the sampling procedures used are detailed. The development of the data instruments and the methods used to collect and analyze the data are also itemized.

STUDY SITE

The primary purpose of this study was to understand the influence of a recreational experience in a Brazilian national park on visitors' relationship with nature and on intentions to behave pro-environmentally. The fieldwork took place at Serra dos Órgãos National Park, located in the country's southeast region. The park was established in 1939 to protect 20,030 hectares of the landscape and biodiversity of the Atlantic Forest in the mountain region of Rio de Janeiro state (Figure 3).



Figure 3: Serra dos Órgãos National Park Landscapes, Activities and Logo

The Atlantic Forest is one of the five most threatened biodiversity hotspots on the planet (Myers et al., 2000; Mittermeier et al., 2005) and is recognized as a Biosphere Reserve by UNESCO. Serra dos Órgãos National Park (Parnaso, for its acronym in Portuguese) is located in one of the most significant Atlantic Forest remnants and forms a large corridor to protect that important biome with other federal and state-protected areas.

Among all the protected areas that form the Atlantic Forest corridor in this region, Parnaso has a unique mountainous topology and is the highest section of the Serra do Mar mountain chain. Altitude in the park varies from 80 to 2,275 meters above sea level. This wide altitudinal gradient generated diverse habitats to protect different species and provide various recreational opportunities such as hiking and trekking through an extensive trail system, camping, climbing, and swimming in the river or the waterfalls. Those recreational opportunities and the good infrastructure to support visitation allow visitors to spend from a few hours to several days in the park, bringing to this protected area different visitor profiles.

The motivation to choose Parnaso was based on its adequate support for visitation and infrastructure for research development. The available infrastructure included entrance gates and a visitor center where researchers could easily approach visitors, a Wi-Fi connection used by participants and researchers, and lodging for the researchers inside the park. Other important aspects were the high number of visitors during the time of the year the study was conducted (July and August) and the park staff's interest in the study.

The two main park gates are located in Teresópolis and Petrópolis. Both cities are easily accessed from downtown Rio de Janeiro by just a 2-hour drive or a 3-hour bus ride. The majority of visitors who access the park through the Petrópolis gate are trekkers who will hike the most famous Petrópolis-Teresópolis trail. Those visitors generally spend two nights inside the park, in

the mountain lodges along the way.

Parnaso attracts around 150,000 visitors a year. Visitation is higher in June, July, and August (wintertime in Brazil and high season for mountaineering activities) and in January and February (summertime and high season for water activities). Both seasons attract diverse groups such as families, couples, friends, and guided tour groups.

PARADIGMATIC APPROACH AND RESEARCH DESIGN

This study is guided by dialectical pluralism, which entertains more than one paradigmatic approach and engages the postpositivist paradigm in conducting quantitative-oriented data collection and the constructivist perspective in qualitative-oriented data collection. The advantage of using more than one research paradigm is “to put the two [approaches] in conversation with each other throughout the study to allow for deeper understandings based on the convergence and dissonance found in the approaches.” (Greene and Hall, 2010, p. 124).

The choice of the method(s) to be used in a study depends on the nature of the research question(s) and research objectives (Creswell, 2006). This study is an exploratory study that used a mixed methods approach to understand the complexity of the visitor experience in a Brazilian national park and its effects on the relationship between visitors and nature. It is hypothesized that improving that relationship would also enhance public support for nature conservation and, consequently, support for protected areas in Brazil.

The mixed methods approach included associated qualitative and quantitative approaches to form the method components of this research. One quantitative and two qualitative phases were planned and conducted to answer the research questions, allowing the study's results to form a comprehensive whole. A mixed methods design is more than simply collecting and analyzing both kinds of data; it addresses the research questions to produce more robust results

and provide an enhanced understanding of studied phenomena compared with a single method approach (Morse, 2003; Creswell, 2006; Byrne & Humble, 2007).

This study's quantitative phase was conducted using a pretest-posttest design. Pre-experience and post-experience surveys were applied to Parnaso's visitors to measure their relationship with nature. The qualitative phase was conducted using two different methods of data collection. The first one was an open-ended questionnaire applied during the experience in the park using ESM. The questionnaire aimed to complement and clarify the quantitative findings by identifying aspects of the experience related to changes in the relationships with nature when comparing the results of the pre and post-tests. The second qualitative data collection method consisted of conducting in-depth interviews by telephone with a smaller group of visitors selected from a subsample (those who answered both pre- and post-surveys but not necessarily the ESM questionnaire), one week after their experience in the park. This step was planned during the fieldwork when it was clear that not all participants were complying with the ESM protocol, and the interviews could help improve the analysis. Figure 4 explains this study's design.

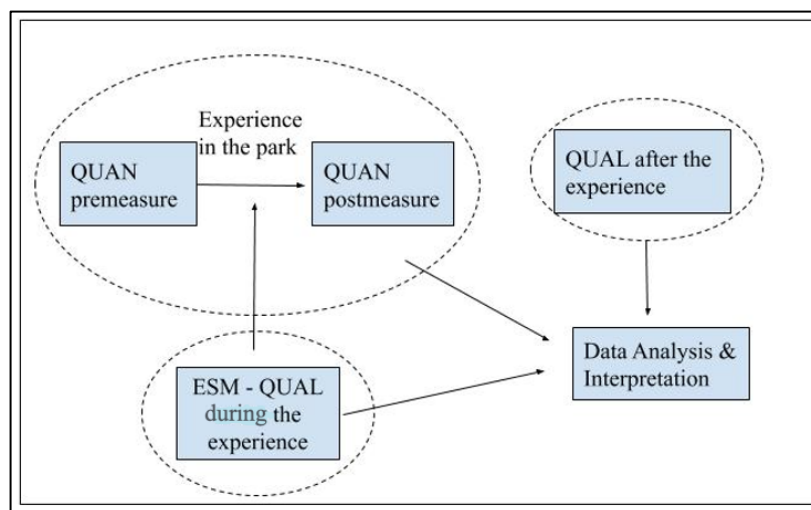


Figure 4: This study's mixed methods approach

In this design, quantitative data were analyzed first and informed the qualitative phase.

STUDY POPULATION AND SAMPLING PROCEDURE

The target population was Parnaso domestic visitors aged 18 and above who were visiting the park in July and August 2018. Visitors were approached at the Petrópolis gate (one entry/exit gate) and the Teresópolis gates (one entry gate and one exit gate) by three researcher groups composed of trained college and graduate students, and this study's author. Data were collected from July 13th to August 12th on Fridays, Saturdays, and Sundays during daylight hours, starting at 6 am. Data were not collected from Mondays to Thursdays because there were not enough visitors in the park. To ensure a random selection of participants at the gates, each researcher approached the third group entering the park and invited only one visitor per group to participate, the person with the most recent birthday.

Researchers intercepted 543 visitor groups and, of those, 516 visitors (95%; one visitor per group) agreed to participate in the survey. The approach was based on first telling visitors about the study and its objectives. Visitors who agreed to participate got an orange numbered wristband, which was straightforward to detect visually (Figure 5). The researcher filled out the three first questions of the survey on an iPad (visitor's wristband number, the gate where the visitor was approached, and the gender of the participant) and then gave participants the iPad to self-administer the survey. However, by screening the first 50 data records, the researchers found that many participants were not answering all the questions and were skipping items of the scales; a few of them skipped all items of one scale. To minimize the possibility of having missing data, the researchers started operating the iPads and asking visitors questions, which worked much better.

A thank-you gift was offered to participants, which was a mug with a small spoon

attached to it, both made of coconut fiber, with the park's logo printed on the mug (Figure 5), which worked very well to stimulate participation. The thank-you gift was effectively released to those respondents who completed participation in the three phases of the inquiry (the pre-survey before entering the park, the ESM questionnaire, and the post-survey, applied before they left the protected area).



Figure 5: Thank-you gift offered to participants who completed the pre and post surveys and the ESM questionnaire, and the numbered wristband used to identify participants.

Researchers approached visitors at the Parnaso's main gate (Teresópolis gate), where they anticipated a more diverse sample of visitors concerning the types of groups (families, couples, friend groups) and the objectives of the visit (swimming, picnicking, hiking). Researchers also approached visitors at the Petrópolis gate, where the vast majority of them were hikers who were going to hike the most known trail in the park, the Petrópolis-Teresópolis trail. In this case, visitors entered the park through the Petrópolis gate and left the park through the Teresópolis gate, staying one or two nights in the park along the trail; in that case, participants answered the pre-survey at the Petrópolis gate and the post-survey at the Teresópolis gate. Figure 6 below shows the Parnaso's boundaries, the gate locations, and the Petrópolis-Teresópolis trail layout.

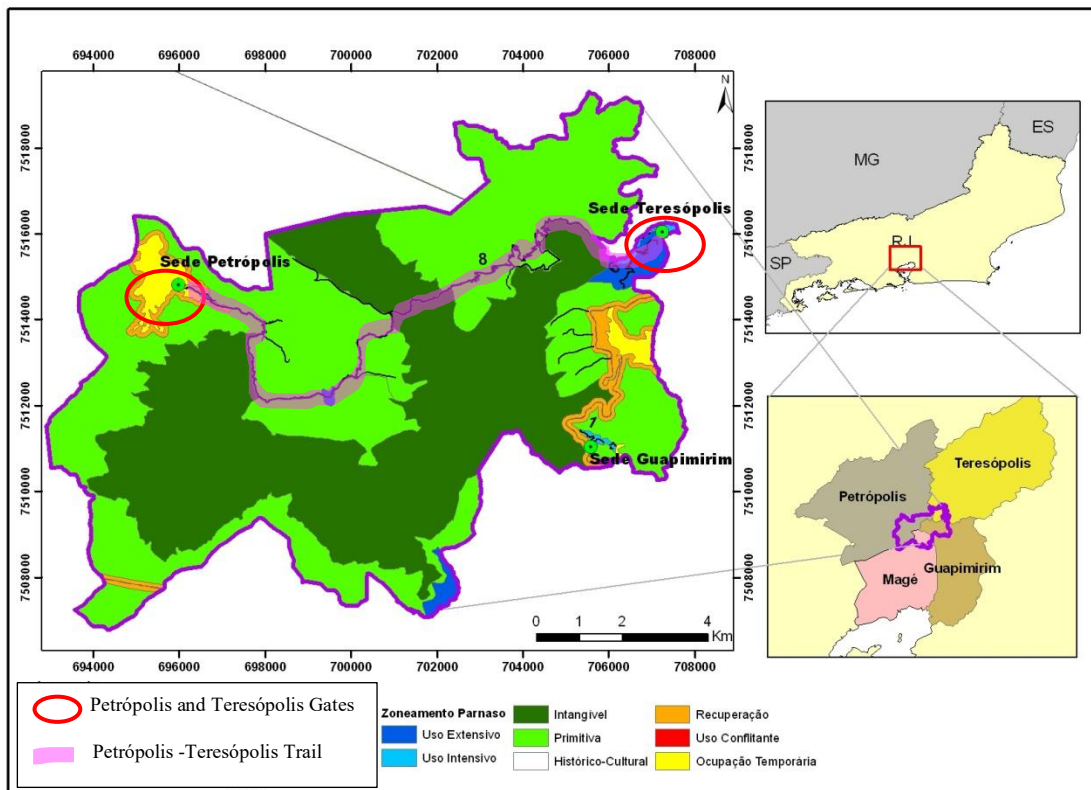


Figure 6: Parnaso's main gates (Petrópolis and Teresópolis) and the most famous park's trail (Source: Kroeff & Silva, 2010)

THE QUANTITATIVE PHASE OF THE STUDY

Pretest-Posttest design

A pretest-posttest design is a kind of longitudinal design where measurements are taken both before and after an event of interest (in this case, the recreational experience in the park) to study the effects of the event on an individual, increasing internal validity (McArdle, 2009; Seifert et al., 2010). When the same participants are measured on the same variables on two different occasions, the design is often called a within-participants design or a paired data analysis (Bonate, 2000). The repeated measures allow researchers to describe changes within individuals and between individuals and explain such changes in terms of certain variables (Shadish et al., 2002; Barkaoui, 2014; De Veaux et al., 2016). This study used a within-

participants pretest-posttest design because the pre and post-surveys were applied to the same respondents, which increased the power of the experiment by controlling for individual differences between participants.

The present study applied three measurement scales to measure the relationship with nature of a sample of Parnaso's visitors and the impact of the experience in the park on that relationship: a nature connectedness scale, a nature belongingness scale, and a pro-environment behavioral intentions scale. The same items that made up the three measurement scales were asked to the same participants before and after their experience in Parnaso to capture the influence of the visit on those three constructs, controlling for other possible variables (e.g., past recreational experiences, past involvement in environmental causes, age, educational level, physical fitness, etc.). The pretest-posttest design was chosen to avoid unobserved variables (neither measured nor held constant) that could induce the researcher to false correlations. In this case, the focus was on a potential internal change in the relationship with nature due to the experience in the park.

There are some issues to deal with concerning using a pretest-posttest approach because it is important to be sure it will be possible to survey the same individuals before and after the treatment. In this study, that issue was overcome by assigning participants an ID number to match their pre-survey and post-survey responses. As already mentioned, participants received a colored numbered wristband, which they used while in the park. To improve the chances that participants would keep the wristband during their stay and return to answer the post-survey, the researchers told them that the thank-you gift would be delivered only to those who would participate in the three phases of the study. The gift was only delivered upon the return of the wristband.

Of the 516 participants who answered the pre-survey, 288 (56%) answered the post-survey, and 151 (29%) also answered the ESM questionnaire.

Survey Instruments and Procedures

Tablet-based surveys were created for this study using Qualtrics.XM, which is an online survey software. The pre-survey (Appendix 1) and the post-survey (Appendix 2) comprised four sections; only the first section was different in both surveys.

The first section of the pre-survey comprised eleven questions, four about participants' previous recreational experience in Parnaso and other natural areas. Examples of the questions were "How many times have you visited this park?" and "Have you visited other natural areas for recreation in the last two years?". Those questions were asked to understand the influence of previous experiences in nature on visitors' relationships with nature. Another four questions asked participants about the time they expected to spend in the park ("How long do you expect to stay in the park?"), and the type of group they were joining (family or friend groups, etc.). The last three questions were about demographic characteristics (age, educational level, place of residence).

In the first section of the post-survey, participants were asked to answer three questions about their satisfaction with the visit. The second section of both surveys included the nature connectedness scale. The third section presented the nature belongingness scale. The fourth section asked participants about their intentions to behave pro-environmentally (PEBI scale), considering intention as an antecedent to actual behavior (Ajzen, 1991). For each item of the three mentioned scales, participants were asked to rate their agreement with statements on a 5-point Likert-type scale, where 1= strongly disagree, 2= partially disagree, 3=neither, 4= partially agree, and 5= strongly agree. The order of scale items was rotated to alleviate the potential

effects of anticipation of the post-experience survey responses (Miner & Glomb, 2010). The description of the measurement scales used in this study follows below.

The Nature Connectedness Scale

The second section of the pre and post surveys was comprised of a 6-item scale to measure nature connectedness (Table 1), developed by Nisbet and Zelenski (2013), which is a short version of the 21-item Nature Relatedness scale (NRS) developed by the same authors together with Murphy in 2009 (Nisbet et al., 2009). The short scale assesses a sense of connectedness reflected in spirituality and subjective knowledge about the environment. It also captures individual differences in awareness of local wildlife or nearby nature and the need for nature. Examples of the items are: “My relationship to nature is an important part of who I am” and “I take notice of wildlife wherever I am.” The scale was translated into Portuguese and adapted to fit the language, Brazilian Portuguese, and population.

The Nature Belongingness Scale

The third section of the pre and post-surveys consisted initially of 13 statements to measure NB. The scale was first developed for this study based on a comprehensive review of the literature on belongingness drawn from the psychological and social science literature. This review focused on the main dimensions of that construct drawn from existing definitions. The new scale was also based on existing social belongingness scales such as the one by Jones et al. (2000). The 13-item scale was written in Portuguese and asked participants questions to understand whether they felt they belong to nature, felt comfortable being in nature, and felt welcome in the park. The scale was first subjected to a Brazilian peer review process for refinement. After rewording some statements for clarity and adaptation to the Brazilian context, five items were discarded because of the similarity between statements. The 8-item scale was

then pre-tested on 65 visitors at Parnaso between July 6 and July 13, 2018. After pre-testing, reliability estimates were performed as fully explained in the Results section. Using corrected item-total correlation scores, those scale items for which that measure was less than $r = 0.3$ were dropped ($r = 0.3$ is considered the statistical threshold to evaluate relationships between scale items; Nunally, 1978; Halpenny, 2010). Using scale reliability as criteria, the 8-item pool was reduced to 6 statements, as shown in Table 1. The statements "I feel welcome when I visit this national park" and "I think this national park is well-taken care" were removed, leaving the nature belongingness scale with six items.

The Pro-environment Behavioral Intentions Scale

The fourth and last section of the pre and post-surveys included an 11-item scale to measure pro-environment behavior intentions. The eleven items were tailored to the Brazilian context and language and revised for refinement by a Brazilian peer group, the same group that revised the belongingness scale. After rewording some statements for clarity, three items were discarded because of the similarity between statements, leaving the final scale with eight items.

As in Halpenny's scale, this study's PEBI scale was composed of four items asking about general pro-environment behavioral intentions and the other four items asking about parks-specific pro-environment behavioral intentions. The 8-item scale was pre-tested through administration to 65 visitors at Parnaso between July 6 and July 13, 2018. As a result of the pre-test, the item "Talking to or emailing politicians to discuss environmental issues" was dropped due to poor reliability. That left the PEBI scale with seven items.

The corrected item-total correlation was used to drop those PEBI scale items for which that measure was less than $r = 0.3$, which reduced the 7-item scale to six items, as shown in Table 1. The item "Telling my friends to visit parks, reserves, or other protected areas" was

removed.

Table 1: Measurement scales and scales' item codes.

SCALE	ITEM CODE	SCALE ITEM
NC - Nature Connectedness (6 items)	Q17_1	My ideal vacation spot would be a remote, wilderness area
	Q17_2	I always think about how my actions affect the environment
	Q17_3	My connection to nature and the environment is a part of my spirituality
	Q17_4	I take notice of wildlife wherever I am
	Q17_5	My relationship to nature is an important part of who I am
	Q17_6	I feel very connected to all living things and the earth
NB - Nature Belongingness (6 items)	(Q18_1)	I feel I belong to nature
	(Q18_2)	I feel comfortable when I am outdoors in nature
	(Q18_10)	I feel motivated to visit other parks or reserves
	(Q18_14)	I feel good when I am in nature
	(Q18_15)	I feel welcome when I visit parks, reserves, or other protected areas
	(Q18_16)	When I am in nature, I get emotional about its beauty *
PEBI - Pro- Environmental Behavior Intentions (6 items)	(Q19_1)	Learning about the natural environment and how to help solve environmental problems
	(Q19_2)	Talking to others about environmental issues
	(Q19_4)	Reducing energy and water consumption
	(Q19_5)	Learning more about parks, reserves and other protected areas
I have the intention of:	(Q19_7)	Supporting parks, reserves, and other protected areas by volunteering my time
	(Q19_8)	Picking up the trash people throw on the trail while I am visiting a protected area

(*) It wasn't easy to translate this item into English. In Portuguese, the sentence has a strong meaning, like if nature could start strong feelings of belonging, mostly because of its beauty.

THE QUALITATIVE PHASE OF THE STUDY

This study's qualitative phase was conducted using two different data collection methods: an open-ended ESM questionnaire and an in-depth interview conducted by telephone.

1) The Experience-Based Approach and The Experience Sampling Method

This study used the experience-based approach to understand if aspects of the onsite experience could positively influence participants' level of nature connectedness and belongingness, and consequently, the intentions to behave pro-environmentally.

The experience-based approach has its basis on the work of Clawson and Knetsch (1966) and their model of experience phases. In this study, the onsite phase of the experience was examined as it unfolded through the use of ESM, which aimed to address the limitations of other techniques by capturing perceptions from momentary experiences. ESM allows the researcher to get a more accurate and valid measure of experience compared to recall methods (Barrett & Barrett, 2001; Christensen et al., 2003; Quinlan Cutler et al., 2016), getting the variability of feelings and emotions that happens during an event (McIntyre & Roggenbuck, 1998; Scollon et al., 2003).

The queries made to participants in ESM research are generally focused on the characteristics of the setting, social context, activities being performed, feelings and thoughts (Hektner et al., 2007). Participants are asked to complete brief surveys or questionnaires at random or specified times that can be combined with other data to elucidate the connections between subjective experience and other outcomes (Zirkel et al., 2015).

There are three different types of experience sampling protocols that researchers generally use (Scollon et al., 2003; Christensen et al., 2003; Quinlan Cutler et al., 2016): the first protocol is the interval-contingent sampling, which involves reporting on experience at predetermined time intervals throughout the day (e.g., at the same time every day or at regular intervals); the second one is called signal-contingent sampling and is the typical ESM protocol (Scollon et al., 2003; Hektner et al., 2007), which presupposes participants will report on the momentary experience in response to a signal at various times throughout the day. Signals come at unpredictable times and are based on fixed and/or random schedules where participants remain unaware of when they will be next signaled; the third protocol is called the event-contingent sampling and involves reporting experience immediately or closely following a particular event

of interest. Some authors (Jones et al., 2003; McIntyre & Roggenbuck, 1998) refer to a fourth sampling protocol, the place-contingent sampling, which involves completing a self-report upon reaching a specific location. Using this protocol, researchers can assess the same environmental attributes amongst participants (Quinlan Cutler et al., 2016).

To understand aspects of participants' experiences and relate them to improvements in participants' relationships with nature, this study's ESM questionnaire explored visitors' thoughts and feelings about their experiences in the park. The ESM protocol used was the event-contingent sampling which involves reporting experience immediately or closely following a particular event of interest. In the present case, the events of interest were the moments considered memorable by participants while visiting the park.

After agreeing to participate in the ESM part of the study, visitors were asked to download an app-based data collection instrument in their Smartphones by reading a QR code. Survey123 for ArcGIS from Esri Geospatial Cloud was the software used to collect data. The software is a digital solution for data collection and helps create smart forms, besides supporting multiple languages (including Brazilian Portuguese). The researchers offered a Wi-Fi connection to those participants who had problems using their own data package for downloading the app. Respondents were first told how the app would work. After familiarizing themselves with it, they were asked to take four pictures of memorable moments during their visit using their Smartphones' built-in cameras, upload the images into the app and answer a brief questionnaire after each shooting. The objective of the pictures was to work as triggers to stimulate participants to comply with the protocol. That means they would shoot a photo and answer the questions as soon as they felt that a moment was like a memorable one in that visit. The questionnaire was composed of three open-ended questions: the first one asked why participants chose that image

to represent a memorable moment of their visit; the second one asked what that image conveyed to them; the third question asked what they liked most in the place and context where they took the picture.

The same 65 respondents who participated in the pre-survey and post-survey pre-tests were asked to download the APP and answer the ESM questionnaire during their experience in the park. Besides testing the questions, the ESM pre-test intended to get information about compliance and retention rates and understand if ESM was overly burdensome and an intrusion in visitors' experiences (Scollon et al., 2003). Fifty-five participants (83%) agreed to download the APP. Of these, only 20 (36.4%) effectively answered the ESM questionnaire, uploading an average of two pictures each and consequently two sets of answers to the app database. It was impossible to identify the reasons for that response rate. That rate could have resulted from asking respondents to participate in too many research phases (three research phases), or the ESM questionnaire could have been an intrusion in their experiences. However, according to van Berkel et al. (2019), missing data is inherent to ESM protocols, and "the gradual decline of response rate throughout the [ESM] study is a well-documented phenomenon" (p. 120). On the other hand, Fuller-Tyszkiewicz et al. (2013) affirmed that response fatigue could undermine more the number of responses less than the obtained data quality. Therefore, based on the pre-test, response fatigue was expected. To overcome that or to have a better response rate, the researchers tried to improve participant compliance over time by providing a more convincing explanation of the ESM phase's importance.

Data were collected and stored on participants' Smartphones using Survey123 even when there was no Internet connection, which was the case in many trails and sites inside the park. Before leaving the park, when participants returned to do the tablet-based post-survey at the

gates or the visitor center, they were offered a Wi-Fi connection and invited to upload the data to this study's Survey123 database.

2) The Telephone In-Depth Interview

Decisions concerning data collection that can influence the quality of study may be made in the field (Morse et al., 2002) to avoid analysis issues or correct problems. The in-depth telephone interview questions were planned during the fieldwork due to a preliminary data analysis that showed that not all participants were complying with the ESM protocol. Moreover, some participants were texting concise answers, which did not clarify the aspects of their experience that could stimulate their relationship with nature. Therefore, that second data collection method (the in-depth interviews) was important to complement the quantitative and ESM analyses.

When answering the post-survey, participants were asked if they would participate in a semi-structured in-depth interview a few days after their experience in the park. For those who agreed, researchers asked for their telephone numbers. This qualitative phase was planned when a previous analysis of partial data showed evidence of inconsistencies concerning the quantitative results. Therefore, of the 101 respondents who answered the pre- and post-surveys and agreed to provide their telephone numbers, a small group of 50 participants was randomly selected to participate. The objective was to gather information on their experience in the park to clarify and improve the analysis, providing the depth of understanding that the ESM lacked.

The first action was to send a WhatsApp text message to those 50 participants' cell phones, one week after their experience in the park, asking if they would be available to talk to the researcher for about 10 minutes sometime in that week. WhatsApp is the most used messaging app in Brazil that provides text, chat, and share media, including voice messages and

videos with individuals or groups. Figure 7 below shows the WhatsApp text message sent to participants.

Figure 7: WhatsApp text message sent to participants

Hello, my name is Sônia. You were recently visiting Serra dos Órgãos National Park and participated in a study about your relationship with nature and your environmental behavior intentions. As requested at that time, you gave us your phone number so that we could supplement that survey by asking you a few questions over the phone about your experience in the park. The interview will take you about 10 minutes. Therefore, we kindly ask you to text us what are the best day and time to contact you to do the interview. Thank you once more for your cooperation!!

Of the 50 participants who got the message, 27 (54%) scheduled the interview, which was pilot tested with two participants. Interviews lasted from 10 to 25 minutes and were recorded with the participants' permission, transcribed verbatim, and then translated into English. The interview guide (Table 2) was developed based on issues raised in the quantitative study's findings and covered the following themes: the influence of the experience in the park on participant's relationship with nature; the aspects of the experience that could stimulate and improve nature connection and belongingness; and the influence of the experience in the park on their support for nature conservation. Probing questions were asked to help participants think more deeply about the issue at hand.

Table 2: The interview guide.

Questions	
Introduction	Hi, this is Sonia, the researcher who talked to you at Parnaso a few days ago and sent you a WhatsApp message to schedule this interview. Firstly, I would like to thank you for participating once again in the study. You probably remember that we were approaching visitors at Parnaso before they entered the park and before they left the park. Our objective was to understand how the experience in the park could influence visitors' connection to nature, as well as their sense of belonging to nature, and if those feelings have any link with pro-environment behaviors. May I start asking you the questions?
1.	Based on the preliminary data analysis, we have noticed that Parnaso's visitors are already very nature connected and have a keen sense of belonging to nature. It seems that the experience in the park didn't make that much of a difference in that connection. What do you think about that?

2.	Do you think that experiences in natural areas, such as the last one you had in Parnaso, can stimulate or improve your connection to nature? If so, in what way?
3.	What aspects of the recreational experience in nature do you consider most important to influence your connection to nature?
4.	What aspects of the recreational experience in nature do you consider most important to influence belongingness?
5.	Is there anything about your experience in the park that could be improved to stimulate a connection with nature and belonging?
6.	Do you think that experiences in natural areas, such as the last one you had in Parnaso, can influence your behavior concerning the natural environment or encourage greater care for the environment in your daily life? If so, in what ways?
7.	Do you think that experiences in natural areas, such as the last one you had in Parnaso, can influence your behavior concerning the support for parks, reserves, and other protected areas? If so, in what ways? What could you do to support parks, reserves, and other protected areas?

DATA ANALYSIS PROCEDURES

QUANTITATIVE DATA ANALYSIS

For the quantitative data analysis, this study used IBM SPSS Statistics Version 24 and R version 3.6.2 to gain information about the sample, the reliability and validity of the proposed measurement scales, and to assess the fit and the adequacy of the hypothesized conceptual model. Confirmatory factor analysis (CFA) and structural equation modeling (SEM) were used to test whether the data fitted the measurement models and the conceptual model, and multiple linear regression tested the relationship between the summated scales' scores and some covariates.

Descriptive Statistics

Descriptive statistics were computed to understand the characteristics of the sample. Measures of central tendency and variability and frequency distributions of data were analyzed

on the sample's demographics. Some aspects of the visit to Parnaso were also explored (first-time visitors or repeat visitors, time spent in the park, type of group that the participant was joining, etc.), and frequency of visits to natural areas for recreation the last two years.

Reliability and Validity of the Scales

Reliability and validity tests were conducted using SPSS and R version 3.6.2 to understand how closely related, as a group, each one of the sets of the scales' items was (consistency), and the degree to which the three scales were measuring what they were developed to measure (accuracy).

Scale reliability is the proportion of variance in observed scores attributed to the true score of the latent variable being assessed (DeVellis, 2017). The report of a single statistic to summarize the accuracy of an instrument is not the best choice (Cronbach & Shavelson, 2004). Therefore, in this study, three approaches were used to assess scale reliability: Cronbach's alpha (α), Composite Reliability (CR), and Average Variance Extracted (AVE), being the last two measures derived from CFA.

Cronbach's alpha is a measure of internal consistency and is a function of the number of items considered and the mean inter-item correlations (Gliem & Gliem, 2003; DeVellis, 2017). A scale is internally consistent when its items are highly intercorrelated, suggesting that they are all manifestations of the same latent variable. For measurement scales, an alpha coefficient between 0.65 and 0.70 is considered minimally acceptable (DeVellis, 2017), while α between 0.70 and 0.80 is regarded as a good indication of reliability and between 0.80 and 0.90 an excellent indication (Nunnally, 1978; Costello & Osborne, 2005). The closer Cronbach's alpha coefficient is to 1.0, the greater the internal consistency of the items in the scale.

As an alternative measure of reliability, composite reliability is considered a robust measure because it accounts for differences in variances between observed and latent variables, unlike Cronbach's alpha. While Cronbach's alpha assumes that the scale is unidimensional and that items are equally related to the construct (i.e., the factor loadings would be the same for all items), composite reliability considers the varying factor loadings of the items. The more factor loadings fluctuate among items, the higher the discrepancy between composite reliability and Cronbach's alpha. Suitable values for composite reliability are 0.7 and above (Gefen et al., 2000; Hair et al., 2014).

Validity is the extent to which a research instrument measures what it has been designed to measure and can be inferred from how the scale was developed and the scale's relationship to other constructs' measures (DeVellis, 2017). In this study, the validity of the measurement scales was assessed by examining the content and construct validities.

As for content validity, the most important action is to consider the latent variable carefully by choosing the items that will adequately reflect that domain and an internal structure that is consistent with the theory (Devellis, 2017; Costa et al., 2019). In the present study, the scales' items were drawn from insights and instruments gained from an in-depth review of theoretical literature. Content validity was assessed by checking the measurement models against the conceptual definition of the constructs. The items were first translated into Portuguese, and the wording was adapted to fit the language and population. Before applying the surveys, the items were reviewed by Parnaso's staff and Brazilian professors who had extensive experience researching visitor use in Brazilian national parks. Then, the survey was pre-tested on 65 Parnaso's visitors.

Convergent and discriminant validity were measured to assess the construct validity of the latent variables presented in this study's proposed conceptual model. Construct validity determines whether the scale based on the theory shows patterns of correlations with other measures. Relationships between constructs are indirectly assessed by studying the relationships between measures (Devellis, 2017). To establish convergent validity, it is necessary to show that measures that should be related are in reality related. In this study, convergent validity was assessed by analyzing the scales' items' intercorrelations and the average variance extracted (AVE) estimates. AVE should exceed 0.5 to suggest adequate convergent validity (Fornell & Larcker, 1981; Bagozzi & Yi, 1988). Discriminant validity is the extent to which one latent variable discriminates from other latent variables, which means that a latent variable should account for more variance in the observed variables associated with it than with other constructs within the conceptual model (Fornell & Larcker, 1981). Discriminant validity was assessed by comparing the square root of the average variance extracted (AVE) for each measurement model against the correlation between each pair of constructs.

Factor Analysis

CFA was the factor analysis technique performed to test whether the hypothesized measurement models fit the data, using Lavaan version 0.6-5 in R version 3.6.2. CFA is a theory-driven technique guided by theoretical relationships between observed and latent variables (Schreiber et al., 2006). Model fit means how well the proposed model accounts for the correlations between observed variables in the dataset. A good fit shows that the model accounts for all the major correlations inherent in the dataset regarding the observed variables in the measurement model (Hu & Bentler, 1999; Creswell, 2008; Hair et al., 2014).

To start the analysis, data were screened for missing points that were handled during a preliminary cleaning of the data. In this study, missing data occurred when a respondent failed to answer one or more items of a measurement scale. The four-step process suggested by Hair et al. (2014) for identifying missing data and how to handle it was used (1- Determine the Type of Missing Data (ignorable or not), 2- Determine the Extent of Missing Data; 3- Diagnose the Randomness of the Missing Data Processes; 4- Select the Imputation Method). Pre and post data had observations showing more than one missing point per scale. To be conservative, those observations were deleted listwise (Kline, 2005). The resulting pre and post datasets still had missing data, this time with observations showing no more than one missing point per scale, which were randomly spread and showed no identifiable pattern. Moreover, the amount of missing data was low enough (less than 10% randomly missing data), and because of that, any approach for remedying missing data would not affect the results, “even if it operates in a nonrandom manner.” (Hair et al., 2014, p.45). Therefore, missing data were handled by imputation involving the replacement of missing values with estimated values based on the information available in the sample, in this case, substitution by the participant's total score mean.

Next, the Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy and Bartlett's test of sphericity were performed to indicate the suitability of the data for structure detection. The null claim was that there was no association among the items for each construct. Values less than 0.05 of the significance level for Bartlett's test of sphericity (Dziuban & Shirkey, 1974), as well as a minimum value of 0.7 for KMO (Cerny & Kaiser, 1977; Hair et al., 1987), may indicate that factor analysis may be helpful with the data.

A fundamental requirement for creating a summated scale is that the items are unidimensional (i.e., they should correlate well with one another and represent a single construct). Therefore, the unidimensionality of the constructs was assessed using the principal component analysis (PCA), which is a variable-reduction technique that aims at reducing a larger set into a smaller group of variables; that smaller group would account for most of the variance in the original variables. The rules regarding the maximum variance explained by the first principal component (usually expressed as the percentage of total variance) and the eigenvalues-greater-than-one rule were applied to determine the number of components to retain (Hattie, 1985; Hair et al., 2014; DeVellis, 2017).

To deal with data distribution issues, the robust maximum likelihood was the method chosen to estimate CFA. Although maximum likelihood (ML) estimation is the most commonly used estimation technique in CFA (Hair et al., 2014), it requires the assumption of a multivariate normal distribution of the variables. Past research has shown that robust ML is a well-behaved estimator across different levels of non-normality and is a commonly used estimator for non-normal continuous data (Satorra & Bentler, 1994; Brown, 2006).

A factor loading is a correlation between the observed variable and the factor (latent variable). The squared loading is the amount of the variable's total variance accounted for by the factor (Hair et al., 2014). Standardized loadings of variables should be statistically significant and greater than 0.50 (Kline, 1998; Hair et al., 2014). To assess model fit, there are numerous goodness-of-fit indicators (Hair et al., 2014). Commonly used for one-time analyses are the Tucker-Lewis Index (TLI), the Comparative Fit Index (CFI), and the Root Mean Square Error of Approximation (RMSEA). Besides those indicators, this study reported the Chi-square statistic for each model and the Standardized Root Mean Residual (SRMR). Chi-square statistic,

RMSEA, and SRMR are absolute fit indexes and examine how well the model reproduces the observed data. Chi-square provides a statistical significance test and compares the observed and predicted covariance matrices, looking for no differences between matrices to support the model as representative of the data. A relatively small Chi-square value and a corresponding large p-value (indicating no statistically significant difference between the two matrices) support the proposed theoretical model being tested (Hair et al., 2014). However, this statistically-based fit measure is a function of sample size and number of observed variables, so it is not used as the only goodness-of-fit measure. RMSEA analyzes the discrepancy between the hypothesized model and the population covariance matrix, avoiding sample size issues (Hooper et al., 2008). The RMSEA ranges from 0 to 1, but lower values indicate a better fit. A cutoff criterion for determining model fit for continuous data is $RMSEA < 0.06$ or between 0.06 and 0.08 with a confidence interval (Hu & Bentler, 1999; Schreiber et al., 2006). Some authors agree that a value of RMSEA between 0.05 and 0.10 is considered acceptable (Rupp & Segal, 1989), and $RMSEA < 0.05$ indicative of an excellent fit (Kline, 2011). SRMR is the square root of the discrepancy between the sample covariance matrix and the model covariance matrix and ranges from 0 to 1, with a value of .08 or lower being indicative of an acceptable model (Hooper et al., 2008; Schreiber et al., 2006).

The TLI and CFI are the most widely incremental fit indices reported. They assess how well the estimated model fits relative to an alternative baseline model (null model), where the observed variables are uncorrelated. TLI compares the normed chi-square values (the chi-square index divided by the degrees of freedom) for the null and estimated model; TLI is not normed, and thus its values can fall below 0 or above 1. CFI values range from 0 to 1, with larger values indicating a greater improvement in fit. Bentler and Bonett (1980) and Barrett (2007)

recommended CFI and TLI levels above 0.90 to demonstrate a good fit. For other authors, a cutoff criterion for continuous data is TLI >0.95 and CFI >0.95 for an acceptable model fit (Hu & Bentler, 1999; Schreiber et al., 2006).

Structural Equation Modeling

SEM extends the possibility of analysis to explain the relationships among latent variables, which are measured indirectly by examining consistency among multiple observed variables. The technique can be understood as a composition of CFA and multiple regression and encompasses two components: a measurement model and a structural model (Schreiber et al., 2006; Hair et al., 2014). The three measurement models in this study represent the theory and show how the observed (measured) variables come together to represent the constructs in the structural model. The structural model expresses the relationships among constructs, which are transcribed into a series of regression equations for the dependent variable.

Before applying SEM to the structural model using SPSS/AMOS, the reliability and construct validity of the measurement models were assessed, and model fit by performing CFA for each scale as informed before. This approach is recommended by Hair et al. (2014) since valid structural theory tests cannot be conducted with poor measures; without valid measurement models, it is not recommended to proceed with an examination of the full structural model.

Paired Sample T-Tests – Comparing the means of scales' total scores using pre- and post-survey data

To assess whether the experience in the park influenced participants' connections with nature, their sense of belonging to nature, and their intentions to behave pro-environmentally, the three measurement scales were applied to participants before and after their visit. The central hypothesis was that there would be an increase in scales' summated scores due to the experience,

meaning that participants would score higher on connectedness, belongingness, and PEBI after the experience in the park.

The statistical procedure used in this study to analyze the mean difference between the two sets of observations (pre and post-tests) was the paired sample t-test. That test assumes as the null hypothesis that the true mean difference between the paired samples is zero, meaning that all observable differences are explained by random variation (Cohen, 1988). The alternative hypothesis assumes that the true mean difference between the paired samples is not equal to zero. Although the direction of the differences matters since it is expected that the difference between scale mean scores (post minus pre) is positive, a two-tailed hypothesis was used, which assumes that that difference is not equal to zero.

Paired t-tests were applied to the paired scales' total scores using 235 observations (sample size) resulted from the pre-data and post data merged by the wristband number. Statistical significance was determined by looking at the p-value.

Multiple Regression

Multiple regression analysis is a general statistical technique used to analyze the degree and character of the relationship between a single dependent variable and several independent variables (Hair et al., 2014). The objective of multiple regression analysis is to predict the changes in the dependent variable in response to changes in the independent variables (Leech et al., 2003; De Veaux et al., 2016) and compare two or more sets of independent variables to examine their predictive power.

The estimated regression coefficients are indicators of the sign (positive or negative) and strength of the relationship between independent and dependent variables in the regression equation, meaning they are indicators of the relative impact and importance of the independent

variables on the dependent variable. The value of one coefficient indicates the change in the dependent variable each time the independent variable changes by one unit when all the other independent variables are held constant.

In the present study, SPSS was used to perform a multiple regression to analyze the predictive power of NC and NB on PEBI. It was hypothesized that the change in PEBI total score (the dependent variable; the change in score equals post-score minus pre-score) is related to changes in NC and NB total scores (the independent variables). Besides the two independent variables just mentioned, the following covariates were added to the analysis to verify whether they show any relationship with PEBI: gender, age, educational level, number of visits to the park, time spent in the park on the day of the survey, and frequency of visits to other natural areas for recreation. To incorporate those categorical variables into the regression equation, they were recoded into dummy variables.

The assumptions underlying multiple regression analysis – the linearity of the phenomenon measured, a constant variance of the error terms (homoscedasticity), the independence of the error terms, and the normality of the error term distribution – were examined. Multicollinearity was another aspect assessed since it could undermine the statistical significance of an independent variable (Hair et al., 2014). Multicollinearity is measured as the correlation among independent variables. It can reduce the predictive power of an independent variable because of its association with the other independent variables in the equation (Ringle et al., 2015). In this study, multicollinearity was measured using the variance inflation factor (VIF), which assesses how much the variance of an estimated regression coefficient increases if predictors are correlated.

QUALITATIVE DATA ANALYSIS

This study used a Grounded Theory approach to analyze the qualitative data (ESM and interview data), offer insight into how participants made sense of their trip to Parnaso, and enhance understanding of the influence of the participants' experiences in their relationship with nature. The Grounded Theory approach is an explorative qualitative research method that aims to develop theory or explanation for an event grounded in data through comparative analysis and interpretation (Corbin & Strauss, 2008).

The first steps were to download the ESM data and transcribe verbatim the recorded interviews. Both data sources were in Portuguese and, after being read many times, were translated into English. These English data were organized into tables, which are found in Appendices 4 and 5. The ESM data were grouped according to participants' PEBI scores (increase, decrease, or neutral/no difference), comparing post-trip scores with pre-trip scores (Appendix 4). These categories provided a structure for analysis that would pick up on differences related to how the experience changed a visitor's PEBI score. The interview data were also organized in a table (Appendix 5), and the answers were arranged around the related questions, which compound the interview guide found in Table 2. A pseudonym was given to each interviewee to protect her/his anonymity.

The ESM data and the interview transcripts were read several times, carefully examined, and analyzed to start the comparative analysis and open coding. Similar text segments were grouped into main themes; the diverse meanings in each text segment under the themes originated the subthemes. A comprehensive list of all themes and subthemes was condensed in codebooks, one for the ESM and one for the interview data, which subsidized the qualitative analysis, together with original quotes presented to support the themes and subthemes. The data

investigation was conducted on printed versions and similar data grouped using colored pens to prevent relevant information from being omitted during the coding process.

It is impossible to separate the researcher who is performing qualitative research, his/her personal and professional knowledge, prior experience, ideas, and prejudices, from the research process (Galdas, 2017; Birks et al., 2019). However, this study's author tried to remain transparent about the analysis process and acknowledge the influence of her perspective and background on the process. Considering that bias can be presented in all research and all stages of the study design (Smith & Noble, 2014), it was vital to be critical about the researcher's preconceptions and work hard to overcome any bias that could compromise the quality of the study results. Qualitative research literature has called attention to the danger of letting preconceptions rise from the researcher's knowledge and experience onto the analysis. To avoid that and follow Morse et al. (2002) and Birks et al. (2019), the researcher outlined her assumptions in a memo, which facilitated identifying potential sources of bias, preventing them from influencing the study results. Thus, all qualitative data obtained (ESM data and interview data) were analyzed with a clear and unbiased mind by continually re-evaluating responses, themes, and subthemes to keep pre-existing assumptions out of the analysis. According to Corbin and Strauss (2008), it is more helpful to acknowledge our beliefs and use the experience to enhance the analytic process. Moreover, triangulation among the researcher and quantitative and qualitative outcomes were applied to gain diverse perspectives on the issues studied and avoid bias.

CHAPTER IV

RESULTS

This chapter begins with a description of the sample characteristics (sample size, demographics), the aspects of the participants' visits to Parnaso (first-timers or repeat visitors, type of group and number of people in the group, time spent in the park in the day of the research), and the frequency of their visits to protected areas for recreation. Then, the reliability and validity of the three measurement scales (NB, NC, and PEBI) are reported and paired t-tests to compare the means of scales' total scores using pre and post-data. Next, ANOVA and post hoc tests report if the independent variables mentioned above influenced any of the three constructs. Finally, the overall measurement model fit is assessed and reported, and multiple regression results to report the association between NC, NB, and PEBI.

After, the qualitative phase of this study (the ESM questionnaires and the in-depth telephone interviews) is reported and analyzed to help understand the characteristics and influence of the park experience on the study's proposed constructs.

QUANTITATIVE RESULTS

SAMPLE AND SUBSAMPLES SIZES

Researchers intercepted 543 visitor groups and invited one visitor per group to participate in the research. Of those 543, 516 visitors (95%) agreed to participate. There were some problems with data uploads and technical issues with the iPads and the software (Qualtrics XM). By addressing those issues resulted in a final sample size of n=471. Of the 516 participants who answered the survey before the experience in the park (pre-survey), 288 (56%) also answered the survey after the experience (post-survey). The same data cleaning procedure was done to the post-experience data, and the final sample size was n=261. Finally, by pairing pre and post-data by participant's wristband number, the number of the dataset matched entries was n=235 (Table

3). Of the sample which answered the pre-trip survey, 151 participants also answered the ESM questionnaire during their experience in the park. Still, only 54 respondents participated in the study's three phases (pre, post, and ESM). Moreover, the researcher interviewed twenty-seven participants by telephone one week after their experience in the park; all interview participants answered the pre and post-surveys, but only eight people participated in all the study phases (pre, post, ESM, and the interview).

Table 3: Final sample and subsamples sizes after data cleaning considering all phases of the study.

	Pre Survey	Post Survey	ESM Quest	Pre+ Post	Pre+ Post+ ESM	Phone Interview^a	Pre+Post+ ESM+ Interview
Sample Size (after data cleaning)	471 (100%)	261 (55%)	151 (32%)	235 (50%)	54 (11%)	27	8

a. All interview participants answered the pre and post surveys

SAMPLE CHARACTERISTICS

Participants were Brazilians over 18, with 81% residing in Rio de Janeiro state. Among those, 25% were residents of Parnaso's surrounding cities (Teresópolis, Petrópolis, and Guapimirim). The sample was about evenly split on gender, with 51.6% being female and 48.4% male. The vast majority of participants (69.3%) were under 39 years old and highly educated, with 80% having some college and, among them, 24.3% possessing a graduate degree.

The sample was evenly split on participation history, with 47.4% of respondents being first-time visitors and 52.6% repeated visitors. Among the repeat visitors, 56% had visited the park four times or more. Most participants (76.1%) affirmed they were used to visiting protected areas for recreation, and among those, 80% had been to three or more of these sites in the last two years.

Most participants (80.8%) entered the park through its main gate (Teresópolis gate). The majority of visitors approached at that gate were one-day visitors and planned to stay from 1 to 9

hours in the park, hiking one or more trails in that area, having a family picnic, or participating in a yoga class. As explained in the Methods section, researchers also approached visitors at the Petrópolis gate (Figure 6), mostly trekkers going to hike the most famous park's trail, a long-distance trail (a 2 or 3-day hike) named Petrópolis-Teresópolis. Therefore, considering both gates (Teresópolis and Petrópolis) and concerning the length of the visit, 43% of participants stayed in the park from 3 to up 9 hours (one-day visit), while 31.4% were in the park less than 3 hours. About a fourth (25.6%) of participants stayed one or two nights inside the park. Around half of the sample visited the park with a group of friends or family (4 or more people), while couples were accounted for 25% of the sample.

RELIABILITY OF THE MEASUREMENT SCALES

In this study, the reliability of each of the three measurement scales was examined by computing Cronbach's alpha (α) and Composite Reliability (CR), as explained in the Methods section. The estimates were calculated using R version 3.6.2. The CR values were computed based on the standardized factor loadings (Table 6), which were calculated running CFA for each scale. The two estimates (α and CR) were computed using pre-survey data and post-survey data (Table 4).

The nature connectedness scale

The NR-6 scale (6 items) developed by Nisbet and Zelenski (2013) and translated into Brazilian Portuguese showed good internal consistency when tested using both pre- and post-survey data (Cronbach's alpha and CR were higher than the standard of 0.7). A Cronbach's alpha of 0.770 and a CR of 0.785 were achieved for the NC scale using the pre-survey data.

Calculating the estimates using post-survey data, larger alpha and CR were achieved, $\alpha=0.810$, and $CR=0.822$.

The nature belongingness scale

For the NB scale (6 items), Cronbach's alpha of 0.690 and CR of 0.718 were achieved using pre-survey data. Using the post-survey data, larger alpha and CR were found, $\alpha=0.750$, and $CR=0.778$. Based on the results for α and CR, one can say that the nature belongingness scale showed good internal consistency.

Pro-environmental behavior intentions scale

Using the pre-survey data, a Cronbach's alpha of 0.786 and CR of 0.794 were achieved for the PEBI scale (6 items). For the post-survey data, a larger alpha and CR were achieved: $\alpha=0.828$, and $CR=0.837$. Based on the results for α and CR, one can affirm that the PEBI scale showed good internal consistency.

Table 4 provides reliability estimates for all three measurement scales.

Table 4: Reliability estimates for the measurement scales.

Measurement Scale	Data	Cronbach's Alpha (α)	CR (Composite Reliability)
	Pre-Survey (n=471) Post-Survey (n=261)		
Nature Connectedness (6 items)	Pre	0.770	0.785
	Post	0.810	0.822
Nature Belongingness (6 items)	Pre	0.690	0.718
	Post	0.750	0.778
Pro-Environmental Behavior Intentions (6 items)	Pre	0.786	0.794
	Post	0.828	0.837

Considerations over the measurement scales' reliability using pre and post data

Cronbach's alpha is a function of the number of test items and the average of inter-item correlations. Comparing the scales' reliability for the pre-survey data (n=471 observations) and the post-survey data (n=261 observations), one can see that Cronbach's alpha was higher for the three scales when the post-survey data were used (Table 4). Therefore, the higher alpha was

achieved by increasing the inter-item correlations when using the post-survey data (although there were fewer observations given that $n_{\text{post}} < n_{\text{pre}}$), implying that those data were more consistent measures than the pre-survey data. However, it is not possible to know why the scales performed better after the trip, but it is possible to offer some insights: 1) self-selection of those who were compromised with the survey; 2) participants took longer to answer the post-survey, probably because they were more relaxed when leaving the park and more focused on the questions; 3) most participants rated their visit to the park as excellent (74.4%) or very good (21%), which made them want to share their perspectives over the experience.

FACTOR ANALYSIS - TESTING THE MEASUREMENT MODELS

Two tests were used to indicate the suitability of the data for structure detection. The KMO Measure of Sampling Adequacy indicates the proportion of variance in the observed variables that is caused by the factor. Values close to 1.0 indicate that factor analysis may be useful with the data, and values less than 0.50 indicate that a factor analysis won't be very useful (Cerny & Kaiser, 1977). Researchers in general consider that a minimum KMO value is 0.7 (Hair et al., 1987). KMO values for the three measurement scales using pre and post data were close to 0.8 or higher (Table 5), which indicated that factor analysis should yield distinct and reliable factors.

The second test was Bartlett's test of sphericity, which tested the null hypothesis that the observed variables were unrelated and therefore unsuitable for structure detection. A significance level of less than 0.05 indicates that factor analysis may be useful with the data (Dziuban & Shirkey, 1974). The results for the two tests (KMO and Bartlett's test of sphericity) for the three constructs are shown below (Table 5) and indicate that factor analysis can be performed for the data.

Table 5: Results on KMO and Bartlett's Test of Sphericity for the three constructs of this study.

		NC		NB		PEBI	
		Pre	Post	Pre	Post	Pre	Post
KMO		0.811	0.851	0.798	0.807	0.813	0.854
Bartlett's Test of Sphericity	Approx. Chi-Square	732.758	482.936	435.815	375.810	782.358	565.529
	df	15	15	15	15	15	15
	Sig.	0.000	0.000	0.000	0.000	0.000	0.000

To assess the dimensionality of the measurement scales, PCA was used to confirm that each summated scale consisted of items loading on a single factor (Hattie, 1985; Hair et al., 2014; DeVellis, 2017). The first principal component explains the maximum variance, usually expressed as the percentage of the total variance. Carmines and Zeller (1979) recommended that at least 40% of the total variance should be accounted for by the first component to affirm that a set of items is measuring a single construct (Hattie, 1985). Another strategy is to retain only those components with eigenvalues greater than 1.0. For the three measurement scales, more than 40% of the total variance was accounted for by the first components, and only the first components had eigenvalues greater than one, which confirmed the unidimensionality.

The tests of individual models and the overall model test were performed to verify the hypotheses that were developed for this study, based on the comprehensive review of the literature. All CFA tests were performed using both pre and post data, meaning that there are two sets of fit indexes for each construct, as demonstrated in Table 6.

Sample size is important for running CFA since it relates to the stability of the parameter estimates. However, there is no clear rule beyond 10 participants per estimated parameter, which has been the consensus (Schreiber et al., 2006). In this study, for each measurement model (NC, NB, or PEBI), there was a ratio of 39.2 participants per parameter calculated when using the pre-survey data, and a ratio of 22.6 participants per parameter estimated when using the post-survey data.

Table 6 shows standardized factor loadings, z-statistic and p-values for all items, the fit indexes related in the Methods section for the three measurement scales, the reliability measures (Cronbach's Alpha, composite reliability), and the Average Variance Extracted (AVE) for each latent variable.

The NC scale testing

CFA was performed to assess the individual model fit, and the fit indexes mentioned in the Methods section were measured using the pre and post data. Considering the pre-experience survey data (n=471), the absolute fit indexes measured were RMSEA = 0.034, SRMR = 0.026, and chi-square=11.951, df=9, p-value=0.216. The normed chi-square is an absolute fit statistic calculated as the ratio of chi-square divided by the degrees of freedom, in this case, $\chi^2/df=1.33$. According to Hair et al. (2014), a χ^2/df smaller than 2.0 is considered very good, and between 2.0 and 5.0 is acceptable. Therefore, the three absolute fit indexes suggested a good fit for this model. The other fit statistics also indicated a good fit (CFI=0.993; TLI=0.988).

When testing the model using the post-experience survey data, the fit indexes were: RMSEA = 0.019, SRMR = 0.028, and chi-square=9.544, df=9, p-value=0.388 ($\chi^2/df = 1.06$), CFI= 0.998; TLI= 0.997. The model seemed to fit the post-survey data better if both sets of fit indexes are compared.

Factor loadings show that the observed variables are related to their associated constructs (Hair et al., 2014), and should be at least .5 and ideally .7 or higher, besides showing statistical significance. For the NC scale, all standardized loadings were statistically significant ($p<0.001$) but not all of them were above the generally accepted level (0.5), as demonstrated in Table 6. Considering the pre-experience survey data, two items loaded lower than 0.5 (0.440 and 0.480), i.e. they fell below the less conservative cutoff of 0.5. However, a factor loading below the cut-

off value has to be interpreted against the theoretical background and, in this case, the goal was to test the Nisbet and Zelenski short NC scale in the Brazilian context. Moreover, considering the post-survey data, all items loaded above 0.5, as recommended, which indicates convergent validity.

Another estimate of convergent validity, the AVE values were below 0.5, which is the traditional cutoff for that index. However, if AVE is less than 0.5, but composite reliability is higher than 0.6, the convergent validity of the construct is still adequate (Fornell & Larcker, 1981; Huang et al., 2013). Therefore, the Brazilian Portuguese version of Nisbet and Zelenski (2013) short NC scale maintained the psychometric properties of the original scale when used in the Brazilian context.

The NB scale testing

Using the pre-survey data (n=471), the absolute fit indexes for the NB scale were RMSEA = 0.013, SRMR = 0.028, and chi-square=9.330, df=9, p-value=0.407. The normed chi-square is $\chi^2/df=1.04$, therefore smaller than 2.0, which is considered very good. The three absolute fit indexes suggest a good fit for this model. The other fit statistics also indicated a good fit for the model (CFI=0.998; TLI=0.997).

All loadings were statistically significant ($p<0.001$), which indicates convergent validity. Two of the estimates for NB fell below the less conservative cutoff of 0.5 (Table 6). Although those loadings were lower than preferred, the other evidence (fit indexes) suggested they were not problematic. Therefore, they were retained to support content validity.

The AVE value was below 0.5 (AVE=0.304), which is the traditional cutoff for convergent validity. However, if AVE is less than 0.5, but composite reliability is higher than 0.6 (CR=0.718 in this case), the convergent validity of the construct is still adequate (Fornell &

Larcker, 1981; Huang et al., 2013).

Using the post-survey data (n=261), the absolute fit indexes measured were RMSEA = 0.053, SRMR = 0.042, and chi-square=11.600, df=9, p-value=0.237. The normed chi-square is $\chi^2/df=1.29$, therefore smaller than 2.0, which is considered very good. The three absolute fit indexes suggest a good fit for this model. The other fit statistics also indicated a good fit for the model (CFI=0.980; TLI=0.966).

All factor loadings were above 0.5 and were statistically significant (which indicates convergent validity). The AVE value was below 0.5 (AVE=0.373), but if composite reliability is higher than 0.6 (CR=0.778 in this case) the convergent validity of the construct is still adequate, as mentioned before.

For the NB scale, the model fitted both pre and post data. However, testing the model using the post-survey data, convergent validity was improved.

The PEBI scale testing

For the PEBI scale, when using pre-survey data (n=471), the absolute fit indexes were RMSEA = 0.087, SRMR = 0.039, and chi-square=41.343, df=9, p-value=0.000. The normed chi-square is $\chi^2/df=4.59$, therefore between 2.0 and 5.0, which is still acceptable. The three absolute fit indexes suggested an acceptable fit for this model. The other fit statistics also indicated an acceptable fit for the model (CFI=0.943; TLI=0.904). Previous research has demonstrated that CFI and TLI values in the range of 0.90–0.95 are indicative of an acceptable model fit (Bentler, 1990; Brown, 2006). When these fit indexes are in the mentioned range, it is important to consider the other fit indexes, which in the case of the present measurement model fell in the acceptable range for model fit.

All loadings were statistically significant ($p<0.001$), although the loadings for two

estimates fell below the less conservative .5 cutoff (Table 6). Those loadings were lower than preferred; however, the other evidence (fit indexes) suggested they were not problematic. The AVE value was below 0.5 (AVE=0.403), which is the traditional cutoff for convergent validity. However, composite reliability is 0.794, which indicates adequate convergent validity (Fornell & Larcker, 1981; Huang et al., 2013).

For the post-survey data (n=261), the absolute fit indexes measured were RMSEA = 0.033, SRMR = 0.027, and chi-square=10.719, df=9, p-value=0.295. The normed chi-square is $\chi^2/df=1.19$, therefore smaller than 2.0, which is considered very good. The three absolute fit indexes suggested a good fit for this model. The other fit statistics also indicated a good fit for the model (CFI=0.995; TLI=0.992).

Only one factor loaded below 0.5 (0.471), although very close to the cut-off value, and all loadings were statistically significant (which indicates convergent validity). The AVE value was close to 0.5 (AVE=0.473) and considering the composite reliability which was higher than 0.6 (CR=0.837), the convergent validity of the construct was attested.

In the same way as for the other two measurement scales, the PEBI scale was better suited to the post-experience data.

Table 6: Factor loadings and fit indexes for the three measurement models.

Data Type	Scale Item Code	Std. Item Loading	Z-value	P-value	CFI	TLI	RMSEA	SRMR	AVE
Nature Connectedness									
Pre-data $\chi^2 = 11.951$, df=9, p-value=0.216, $\chi^2/df = 1.33$	Q17_1	0.480			0.993	0.988	0.034	0.026	0.393
	Q17_2	0.440	6.072	<0.001					
	Q17_3	0.555	6.334	<0.001					
	Q17_4	0.534	5.944	<0.001					
	Q17_5	0.792	6.381	<0.001					

	Q17_6	0.845	6.975	<0.001					
	Q17_1	0.586							
Post-data $\chi^2=9.554$, df=9, p-value=0.388, $\chi^2/df=1.06$	Q17_2	0.569	6.338	<0.001					
	Q17_3	0.653	6.461	<0.001					
	Q17_4	0.544	6.019	<0.001	0.998	0.997	0.019	0.028	0.440
	Q17_5	0.797	6.333	<0.001					
	Q17_6	0.786	5.671	<0.001					
	Nature Belongingness								
	Q18_1	0.485							
Pre-data $\chi^2=9.330$, df=9, p-value=0.407, $\chi^2/df=1.04$	Q18_2	0.638	6.167	<0.001					
	Q18_10	0.552	5.262	<0.001					
	Q18_14	0.613	5.732	<0.001	0.998	0.997	0.013	0.028	0.304
	Q18_15	0.592	5.963	<0.001					
	Q18_16	0.385	5.166	<0.001					
		Q18_1	0.546						
Post-data $\chi^2=11.600$, df=9, p-value=0.237, $\chi^2/df=1.29$	Q18_2	0.563	4.465	<0.001					
	Q18_10	0.736	4.667	<0.001					
	Q18_14	0.690	3.702	<0.001	0.980	0.966	0.053	0.042	0.373
	Q18_15	0.581	5.566	<0.001					
	Q18_16	0.517	5.539	<0.001					
	Pro-environment Behavior Intentions								
	Q19_1	0.804							
Pre-data $\chi^2=41.343$, df=9, p-value=0.000, $\chi^2/df=4.59$	Q19_2	0.745	15.560	<0.001					
	Q19_4	0.446	8.579	<0.001					
	Q19_5	0.636	12.393	<0.001	0.943	0.904	0.087	0.039	0.403
	Q19_7	0.650	14.240	<0.001					
	Q19_8	0.433	7.295	<0.001					
		Q19_1	0.851			0.995	0.992	0.033	0.027

$\chi^2=10.719,$ df=9, p-value=0.295,	Q19_2	0.794	12.208	<0.001
	Q19_4	0.503	5.626	<0.001
$\chi^2/df = 1.19$	Q19_5	0.684	8.940	<0.001
	Q19_7	0.724	9.631	<0.001
	Q19_8	0.471	4.526	<0.001

DESCRIPTIVE STATISTICS OF THE MEASUREMENT SCALES

Each item of the three measurement scales tested was measured on a 5-point Likert-type scale ranging from 1 = Disagree Strongly to 5 = Agree Strongly. Therefore, for each participant, summated low values would indicate low involvement with nature, low capacity of seeing her/himself as part of nature, and low commitment with nature conservation. Summated scale values close to five would indicate the opposite, meaning a high connection and involvement, and a high likelihood of engaging in pro-environmental behaviors. Table 7 shows the scales' items (observed variables) for the three constructs used in this study (NC, NB, and PEBI) and the descriptive statistics for each item of each scale (mean and standard deviation), considering the pre and post data.

Table 7: Descriptive statistics for the scales' items based on pre-experience survey data (n=471) and post-experience survey data (n=261).

Latent Variables	Observed Variables	Scale Item Code	Pre		Post	
			Mean	Std. Deviation	Mean	Std. Deviation
Nature Connectedness (NC)	My ideal vacation spot would be a remote, wilderness area	Q17_1	4.61	0.675	4.54	0.745
	I always think about how my actions affect the environment	Q17_2	4.61	0.674	4.61	0.645
	My connection to nature and the environment is a part of my spirituality	Q17_3	4.13	1.142	4.15	1.114
	I take notice of wildlife wherever I am	Q17_4	4.64	0.630	4.62	0.677

	My relationship to nature is an important part of who I am	Q17_5	4.56	0.720	4.55	0.785
	I feel very connected to all living things and the earth	Q17_6	4.48	0.803	4.61	0.645
Nature Belongingness (NB)	I feel I belong to nature	Q18_1	4.45	0.851	4.50	0.811
	I feel comfortable when I am outdoors in nature	Q18_2	4.72	0.570	4.79	0.441
	I feel motivated to visit other parks or reserves	Q18_10	4.76	0.578	4.77	0.539
	I feel good when I am in nature	Q18_14	4.89	0.354	4.88	0.357
	I feel welcome when I visit parks, reserves, or other protected areas	Q18_15	4.65	0.617	4.69	0.555
	When I am in nature, I get emotional about its beauty	Q18_16	4.60	0.682	4.55	0.745
	Pro-Environmental Behavior Intentions (PEBI)	Learning more about the natural environment and how to help solve environmental problems	Q19_1	4.24	0.862	4.33
Talking to others about environmental issues		Q19_2	4.02	0.961	4.07	0.954
I have the intention of:	Reducing energy and water consumption	Q19_4	4.32	0.961	4.46	0.834
	Learning more about parks, reserves and other protected areas	Q19_5	4.27	0.908	4.39	0.833
	Supporting parks, reserves, and other protected areas by volunteering my time	Q19_7	3.52	1.250	3.71	1.111
	Picking up the trash people throw on the trail while I am visiting a protected area	Q19_8	4.55	0.796	4.62	0.750

Table 8 shows the descriptive statistics for each measurement scale (the composite mean score for NC, NB, and PEBI scales and standard deviations) considering pre (n=471) and post-survey (n=261) data.

Table 8: Descriptive statistics for the measurement scales.

Measurement Scale	Pre		Post	
	Mean	Std. Deviation	Mean	Std. Deviation
Nature Connectedness (6 items)	4.51	0.551	4.53	0.538
Nature Belongingness (6 items)	4.65	0.437	4.67	0.407
PEBI (6 items)	4.26	0.618	4.34	0.599

The findings in Table 7 and Table 8 show that participants felt highly connected to nature even before the park experience. The mean summated scores for the NC scale were above 4.5 both before and after the experience (Table 8). Looking at the scale items, the item Q17_3 - "My connection to nature and the environment is a part of my spirituality" had the lowest mean score (4.13 using pre-data and 4.15 using post-data; see Table 7), however, the score was above 4.0.

It is out of this study's scope to understand the previous life experiences of participants and the facts that could shed light on the cause of that high self-assumed nature connection. However, analyzing a 2018 study by IBOPE Inteligência (a Brazilian company specialized in data collection for quantitative and qualitative research) commissioned by WWF-Brazil, Brazilians were more worried about nature conservation and environmental issues than when the first version of the same study was released in 2014. That could indicate that a mindset change might be occurring in the country. That national research surveyed people aged 16 and over of different social classes and asked about their thoughts on protected areas and the environment. The 2018 results revealed a population that valued the natural environment and protected areas and wanted to be closer to nature than the 2014 version of the research (WWF-Brasil/IBOPE Inteligência, 2018).

The same question concerning time spent in nature for recreation was asked in the 2018 WWF/IBOPE research and the present research and showed different results. The WWF/IBOPE research asked a sample drawn from the Brazilian population if they were used to spending time in nature for recreation, and 52% of respondents said "yes". The present research asked the same

question to a sample drawn from Parnaso's visitors (meaning protected areas visitors), and 76.1% of participants answered affirmatively. As expected, there are differences between Brazilians in general and Brazilians who are protected area visitors if one compares the two research pieces. This high percentage of participants who are used to spending time in natural areas for recreation can help explain the high connectedness and belonging scores found in this study. Previous studies have proved that spending time in nature stimulates and improves a relationship with nature (Schultz, 2002; Nisbet et al., 2009; Perkins, 2010; Halpenny, 2010; Zylstra et al., 2014).

Analyzing pre and post scores

Of the 235 participants who answered the pre and post surveys, 82 (35%) scored higher in NC after the experience in the park. The increases in mean NC scores for those participants ranged from 0.17 to 1.5 points (remembering that NC is a 5-point Likert type scale). Sixty-five (28%) participants scored lower in NC after the experience, and 88 (37%) achieved the same score before and after the visit. Therefore, the park experience did make the hypothesized effect (an increase in NC score) for only 35% of participants. That expected effect was tested in the next section by running a paired sample t-test to compare the scales' mean scores before and after the park experience.

Concerning the NB scale, the summated pre- and post-experience mean scores were higher than for the NC scale (Table 8). The individual scale items also had higher mean scores than the NC scale, showing that participants felt welcomed in the park, felt good being in nature, and as part of nature. However, there was not a high increase in summated scores comparing them before and after the experience in the park. The statistical significance of that difference was tested using a paired sample t-test, which is reported in the next section.

Of the 235 participants who answered the pre and post surveys, 57 (24.2%) scored higher on the NB scale after the experience in the park. The increases in mean NB scores for those participants ranged from 0.2 to 1.4 points. Fifty-five (23.4%) participants scored lower after the experience and 123 (52.4%) scored the same before and after the experience.

Comparing the three scales, the lowest summated mean scores were found for the PEBI scale (pre score = 4.26 and SD=0.618; post score = 4.34, SD=0.599) although they were over 4.0. Interestingly, the individual item that had the lowest mean score, below 4.0 (see Table 7), was the Q19_7 about support for parks (I have the intention of..."Supporting parks, reserves, and other protected areas by volunteering my time") since there were in the sample more than 50% of repeat visitors to Parnaso and more than 70% who were used to recreate outdoor in protected areas. Those results could suggest that a strong relationship with nature (which was found analyzing the results and finding out that participants scored high in nature connectedness and belongingness) do not always result in intentions to act in favor of protected areas.

Based on the results of the 2018 version of the WWF/IBOPE research, it was found that the number of Brazilians who think that it is also the responsibility of citizens to care for nature conservation and protected areas grew 20 percentage points compared to the 2014 version of the research, jumping from 46% to 66%. However, the government remains the fundamental actor for that task to 72% of respondents. Analyzing that result together with this study's results on the PEBI scale and on the specific item on supporting parks and other protected areas, one could infer that the beliefs and intentions pro-environment are not always delivered into actions by Brazilians.

Of the 235 participants who answered the pre and post surveys, 106 (45.0%) scored higher on the PEBI scale after the experience in the park. The increases in mean PEBI scores for

those participants ranged from 0.14 to 2.0 points. Seventy participants (29.0%) scored lower in the PEBI scale after the experience and 59 (26.0%) scored the same before and after the experience. In the case of the PEBI scale, the experience in the park did seem to make a difference for the majority of participants and the statistical significance of that difference was tested using a paired sample t-test, which is reported in the next section.

In short, the study participants seemed highly connected to nature and had a strong sense of belonging within the park. There is little evidence, however, of the increase in mean scores for the NC and NB scales as a result of the experience in Parnaso. However, the difference between the mean PEBI scores considering the pre-experience and post-experience data seems to be important, especially because the post score was higher than the pre score for the majority of participants. Below, the paired sample t-tests compare the pre and post mean scores for the three scales to test if there is evidence of significant differences between mean scores for the three scales.

COMPARING THE MEAN SCORES FOR THE NC, NB, AND PEBI SCALES USING PRE AND POST-EXPERIENCE SURVEY DATA

Paired sample t-tests were conducted using R version 3.6.2 to compare the mean scores for the NC, the NB, and the PEBI scales, before and after the experience in the park, and on the same respondents by pairing pre- and post-data by the wristband number. The number of participants in the pre/post dataset was n=235 (participants who answered the pre-experience survey and the post-experience survey). In the first place, all assumptions for a paired t-test were verified (the data are continuous; the differences between the matched pairs follow a normal distribution; the sample of pairs is a simple random sample from its population). The paired sample t-test provides a hypothesis test of the difference between population means for a pair of

random samples and tests the null hypothesis that the mean difference between the two sets of observations is zero (Hsu & Lachenbruch, 2005; VanderKaay et al., 2018).

The statistics for the NC scale using the pre-experience data ($n = 471$) showed a mean score $M=4.51$ and $SD = 0.551$ and using the post-experience data ($n = 261$), a mean score $M=4.53$ and $SD = 0.537$. The paired t-test results for comparing the pre and post means ($n=235$) were $t(234) = 0.57388$ and $p = 0.5666$, using a 95% confidence interval. Therefore, there was no evidence that the mean scores on nature connectedness before the experience were significantly different from the mean scale scores after the experience.

For the NB scale, the statistics were $M=4.65$ and $SD = 0.437$ using the pre-data, and $M=4.67$, $SD = 0.407$ using the post-data. The paired t-test for comparing the pre and post means with a 95% confidence interval showed $t(234) = 1.1918$ and $p=0.2345$, indicating that there was no evidence that the mean scores on nature belongingness before the experience were significantly different from the mean scale scores after the experience.

One issue which might have influenced the above results concerning both scales (NC and NB) could be the fact that the observed variables (scale items) were not measured highly enough (in this case, scale items were measured from 1 to 5 points). Scores clustered around the top (5) because participants could not respond any higher or had no room for improvement, resulting in insufficient variation in the data. It is important to have enough response choices to avoid ceiling effects, resulting in no detection of some real effects on the dependent variable. Seven-point scales could have been a better choice (Orsini & Hulbert, 2015; Howe, 2018). Another reason might have to do with Learning Effects. Prior research has shown that learning effects could threaten validity (Aussems et al., 2011) and can happen when participants are asked the same questions twice (in the pretest and the posttest) and want to appear consistent.

The paired t-test results showed that there is not enough evidence that there was a significant increase in visitors' nature connectedness and nature belongingness due to a recreational experience in a national park. However, for the PEBI scale, results showed evidence that there was a statistically significant increase in the mean scores comparing pre-data (M= 4.26 and SD= 0.618) and post-data (M= 4.34 and SD= 0.599). The paired t-test with a 95% confidence interval provided $t(234) = 3.3503$ and $p = 0.0009416$.

Table 9 shows the number of participants distributed per subsample, as follows: subsample 1 (participants who scored higher in PEBI after the experience in the park compared with their score before the trip), subsample 2 (those who scored lower after the park experience), and subsample 3 (participants who achieved the same before and after the experience in Parnaso).

Table 9: Number of participants per subsample.

Subsample	Comparison between post and pre-experience PEBI total scores by matched pair	Number of observations
1	Increase	106 (45%)
2	Decrease	70 (29%)
3	No Change	59 (26%)
	Total ^a	235 (100%)

- a. Total number of observations by matching pre-data and post-data by participant's wristband number

Next, the characteristics of the three subsamples were analyzed to verify if there were any important differences between them.

Subsample 1 - Descriptive statistics – Those who scored higher on the PEBI scale after the experience

Of the 106 participants who scored higher on the PEBI scale after the experience in the park, the majority were male (55.7%), first-time visitors (53.8%), and were used to visiting other natural areas for recreation (69.8%). A little over half of this subsample (56.6%) was

undergraduate students or had a bachelor's degree. Most participants were young (46.2% were 29 years or younger) and visited the park in groups of four or more friends (49.0%), followed by couples (37.7%). Participants who spent 1-3 hours in the park were 37.7% of the sample, followed by 22.7% who spent the night, 20.7% who spent 3 to 6 hours, and 18.8% who stayed for 6 to 9 hours in the park. Most participants (71.7%) evaluated the experience in Parnaso as excellent, while 24.5% considered it very good.

Subsample 2 descriptive statistics – Those who scored lower on the PEBI scale after the experience

Of the 70 participants who had a decrease in PEBI score after the park experience, most were female (61.4%) and first-time visitors to Parnaso (51.4%), although they were used to visiting other natural areas for recreation (82.9%). Fifty-nine percent had a bachelor's degree, and most were 30 to 49 years old (50.0%). Most participants in this subsample had spent 3-6 hours in the park (35.7%), followed by 27.2% who spent the night, 21.4% who stayed only up to 3 hours, and 15.7% who spent 6 to 9 hours in the park. They visited the park in groups of 4 or more friends (40%), followed by couples (35.7%). Most participants (75.7%) evaluated the experience in Parnaso as excellent, while 18.6% considered it very good.

Subsample 3 descriptive statistics - Those who scored the same on the PEBI scale before and after the experience

Of the 59 participants who reached identical PEBI scores before and after the experience in the park, the majority were female (62.7%), repeat visitors (61.0%), and were used to visiting other natural areas for recreation (84.7%). Participants' age in this subsample was equally distributed: 40.7% were from 18 to 29 years old, and 44.1% from 30 to 49 years old. Nearly half (49.2%) were undergraduate students or had a bachelor's degree. Most respondents (33.9%)

spent 1 to 3 hours in the park, followed by 25.4% who stayed 3 to 6 hours and 23.7% who spent the night in the park. Most participants (42.4%) visited the park in groups of two people (couples) and evaluated the experience in Parnaso as excellent (76.3%), while 18.6% considered it very good. The table below summarizes these findings:

Table 10: Descriptive statistics of the PEBI subsamples

Effect on PEBI after the experience	Subsample	Gender	Education	Age	First-time or repeat visitor to Parnaso	Time spent in the park in hours	Frequent visitor to protected areas	Type of group
Increase	106	Male (55.7%)	Undergrad or Bachelor's degree (56.6%)	29 or younger (46.2%)	First-timers (53.8%)	1-3 (37.7%)	Yes (69.8%)	4 or more friends (49%)
Decrease	70	Female (61.4%)	Bachelor's degree (59%)	30-49 (50%)	First-timers (51.4%)	3-6 (35.7%)	Yes (82.9%)	4 or more friends (40%)
No Change	59	Female (62.7%)	Undergrad or Bachelor's degree (49.2%)	30-49 (44.1%)	Repeat (61%)	1-3 (33.9%)	Yes (84.7%)	Couples (42.4%)
Total	235							

The differences between subsamples' characteristics seem to regard gender, age, and the number of times visiting the park. Young males from 18 to 29 years old were the majority of the sample that increased the PEBI scale score after the park experience. Females were the majority in subsamples 2 and 3, aged between 30 to 49 years old (subsample 2) and equally distributed in subsample 3 concerning the 18 to 29 years old group and the 30 to 49 years old group. First-time visitors were the majority for subsamples 1 and 2 and repeat visitors for subsample 3 (those who made the same score before and after the visit).

ANOVA tests to compare PEBI mean scores across two or more independent variables' factor groups

One-way between-subjects analysis of variance (ANOVA) tests were performed to verify whether any of the visitors' characteristics explored in the surveys influenced the PEBI results. The one-way ANOVA aimed at testing whether there were significant differences between PEBI means for the groups (factors) considering each independent variable. The null hypothesis states that all population PEBI means (factor level means) are equal, while the alternative hypothesis states that at least one is different.

Firstly, a series of one-way ANOVAs with unbalanced designs was conducted in R using the following independent variables: gender (Q5), age (Q14), educational level (Q16), first-time or repeat visitor (Q6), number of visits to Parnaso (Q7), if used to visiting protected areas for recreation (Q8), number of visits to protected areas in the last two years (Q9), time spent in the park in the day of the research (Q10), number of people in the group (Q12) and type of group (Q13), and experience evaluation (Q28).

Considering a 95% confidence level and using the pre-post dataset (n=235; pre-post data were used to include all the variables above in the analysis, including Q28), the results indicated that there are statistically significant differences between PEBI means of the independent groups for the variables Q8 (if used to visiting protected areas for recreation), Q9 (number of visits to protected areas in the last two years), and Q14 (age). ANOVA assumptions were tested using R: normality of the residuals, homogeneity of variance among the group, and independence of residuals. There were no issues with the independence and homogeneity of variance assumptions. Concerning normality, ANOVA is not very sensitive to moderate deviations from normality (Glass et al. 1972; Harwell et al., 1992), especially for large samples, which is the case of the tested data. For Q8, which has two factors (yes or no), the values determined by the one-

way ANOVA were $F(1,233) = 12.88$, $p = 0.0004$ (Table 11). For Q9, with four factors (no trips in the last two years, one trip, two trips, three or more trips), $F(3,231) = 4.659$, $p = 0.0035$. For Q14, with three factors (18-29, 30-49, 50-69 years old, considering that the fourth factor, 70-89 years old, had only one dataset entry and was removed), the values determined by the one-way ANOVA were $F(2,231) = 3.065$, $p = 0.0486$.

Table 11: ANOVA results - statistically significant differences between PEBI means for the independent groups/variables.

Variable	F	p
Q8 (if used to visiting protected areas for recreation)	$F(1,233) = 12.880$	0.0004
Q9 (number of visits to protected areas in the last two years)	$F(3,231) = 4.659$	0.0035
Q14 (age)	$F(2,231) = 3.065$	0.0486

Next, another set of ANOVAs was performed using the differences in PEBI scores (post-experience minus pre-experience scores; Table 12) as the dependent variable and the same independent variables of the first set of ANOVA tests. In this case, the statistically significant differences of the PEBI mean scores, at the $p < 0.05$ level, occurred for the independent variables Q10 (time spent in the park on the day of the research, with four factors: 1 to 3 hours, 3 to 6 hours, 6 to 9 hours, overnight stay in the park) and Q28 (experience evaluation, with three factors: excellent, very good, and good, considering that there was only one dataset entry for the fourth factor, regular, which was deleted). For Q10, $F(3,231) = 2.943$, $p = 0.0338$, and for Q28, $F(2,231) = 2.919$, $p = 0.0349$.

Table 12: ANOVA results - statistically significant differences between differences in PEBI scores (post-experience minus pre-experience scores) for the independent groups/variables.

Variable	F	p
Q10 (time spent in the park on the day of the research)	$F(3,231) = 2.943$	0.0338
Q28 (experience evaluation)	$F(2,231) = 2.919$	0.0349

Post hoc comparison tests

ANOVA showed that there is an overall difference between group factors for some of the variables, as shown above, but it did not tell which specific groups differed. To evaluate which groups were significantly different, post hoc comparisons were conducted. The post hoc test used was the Dunnett's Modified Tukey-Kramer Pairwise Multiple Comparison Test (DTK.test in R) followed by TK.test (which is a reformatted function for DTK.test function-like inputs to use the TukeyHSD function). The DTK test conducts a pairwise multiple comparison test for mean differences with unequal sample sizes and no assumption of equal population variances. The TK.test output gives the difference in means, confidence levels, and the adjusted p-values for all possible pairs of factors considering each independent variable (Lau, M. K., 2015).

The post hoc comparisons (Table 13) indicated that, for Q8, at the $p < 0.05$ level, the PEBI mean score for those who were used to visiting protected areas for recreation ($M=4.3529$, $SD=0.5876$) was statistically significant higher ($p = 0.0004$) than for those who were not used to visiting a protected area for recreation ($M=4.0060$, $SD=0.7419$). For Q9, the test showed that the only statistically significant ($p = 0.0029$) between-factors difference in PEBI mean scores happened for the groups of those who did not visit a protected area in the last two years ($M=4.0060$, $SD= 0.7419$) and those who visited protected areas once over the previous two years ($M=4.5167$, $SD=0.4872$). For Q14, post hoc comparisons indicated that PEBI mean score for those who were from 18 to 29 years old ($M=4.1515$, $SD=0.6802$) was statistically significantly different than PEBI mean score for those who were from 30 to 49 years old ($M=4.3657$, $SD=0.5404$).

Table 13: Descriptive stats for PEBI scores and results of the post hoc comparisons for Q8, Q9, and Q14.

Variable	Group	n	PEBI post-experience scores			
			Minimum	Maximum	Mean	SD
Q8 (if used to visiting protected areas for recreation)	Yes	179	2.500	5.0000	4.3529 _a	0.5876
	No	56	1.500	4.8333	4.0060 _b	0.7419
Q9 (number of visits to protected areas in the last two years)	0	55	1.500	4.8333	4.0060 _a	0.7419
	1	11	3.500	5.0000	4.5167 _b	0.4872
	2	19	3.000	5.000	4.2544 _{ab}	0.5703
	3 or more	150	2.500	5.0000	4.3544 _{ab}	0.5965
Q14 (age)	18-29	99	1.6667	5.0000	4.1515 _a	0.6802
	30-49	108	2.1667	5.0000	4.3657 _b	0.5404
	50-69	27	1.5000	5.0000	4.3333 _{ab}	0.8126

Note: Means with no subscripts in common are statistically significant different, $p < 0.05$.

The results demonstrated that PEBI mean scores were significantly higher for those used to visiting protected areas and did that at least once in the last two years. Age was also an aspect that influenced PEBI mean scores, being that young people (18-29) presented lower PEBI mean scores than older people (30-49).

Using the difference in PEBI scores (participants' PEBI post- experience score minus PEBI pre-experience score) as the dependent variable, and concerning the variable Q10 (length of stay in the park), the results indicated that there was a statistically significant difference ($p = 0.0315$) in PEBI mean scores only for those participants who spent 1 to 3 hours in the park ($M = 0.1750$, $SD = 0.4029$) compared with those participants who spent 3-6 hours in the park in the day of the research ($M = -0.0265$, $SD = 0.3685$). For Q28 (experience evaluation), the post hoc comparisons (Table 14) indicated that PEBI mean score for those who considered the experience

as good (M=0.4444, SD=0.8220) was statistically significant different ($p=0.0237$) than for those who considered it as excellent (M=0.0595, SD=0.4112).

Table 14: Descriptive stats for PEBI scores and results of the post hoc comparisons for Q10 and Q28.

Variable	Group	n	Difference in PEBI scores (post minus pre)			
			Minimum	Maximum	Mean	SD
Q10 (time spent in the park in the day of the research)	1 to 3 hours	74	-0.7143	2.0000	0.1750 _a	0.4029
	3 to 6 hours	63	-1.5714	0.7143	-0.0265 _b	0.3685
	6 to 9 hours	41	-1.7143	1.0000	0.0506 _{ab}	0.4605
	Overnight stay in the park	57	-1.0000	1.7143	0.1412 _{ab}	0.4846
Q28 (experience evaluation)	Excellent	174	-1.7143	1.5714	0.0595 _a	0.4112
	Very good	50	-1.0000	1.3333	0.1457 _{ab}	0.3795
	Good	11	-0.1428	2.0000	0.4444 _b	0.8220

Note. Means with no subscripts in common are statistically significant different, $p < 0.05$.

Here, the results showed that participants who spent up to 3 hours in the park on the day they were sampled, and those who spent the night in the park had the major increases in PEBI scores after the experience in the park. Results also demonstrated that participants who spent up to 3 hours in the park showed a significantly higher increase in PEBI mean scores than those who stayed in the park for more than 3 hours. Concerning the experience evaluation, those who evaluated the park experience as "good" scored significantly higher on the PEBI scale when leaving the park than those who considered the experience "excellent"; although those results are statistically significant, they make no sense and add no useful information to understand the increases in PEBI across independent variables' groups.

ANOVA tests to compare NC and NB mean scores across two or more independent variables' factor groups

Using the pre-post dataset (n=235), at the $p<0.05$ level, the results indicated the same pattern for the NC and NB mean scores. There are statistically significant differences between

the NC means and the NB means for the independent variable groups Q5 (gender, with two factors, female and male), Q8, Q9, and Q14. ANOVA assumptions were tested, and it was verified that there were no issues with the independence and homogeneity of variance assumptions. Concerning normality, ANOVA is robust to moderate deviations from normality.

For the NC mean scores, the values determined by the one-way ANOVAs were: for Q5, $F(1, 233) = 12.18, p = 0.0006$; for Q8, $F(1,233) = 36.98, p = 4.87e-09$; for Q9, $F(3,231) = 12.61, p = 1.16e-07$; and for Q14, $F(2,231) = 5.85, p = 0.0033$. For the NB mean scores, the values determined by the one-way ANOVAs were: for Q5, $F(1, 233) = 8.663, p = 0.0004$; for Q8, $F(1,233) = 27.98, p = 2.84e-07$; for Q9, $F(3,231) = 9.300, p = 7.9e-06$; and for Q14, $F(2,231) = 4.77, p = 0.0093$. Results are summarized in the table below.

Table 15: ANOVA results - statistically significant differences between NC and NB means for the independent groups/variables.

Scale	Variable	F	p
NC	Q5 (gender)	$F(1, 233) = 12.18$	0.0006
	Q8 (if used to visiting protected areas for recreation)	$F(1,233) = 36.98$	4.87e-09
	Q9 (number of visits to protected areas in the last two years)	$F(3,231) = 12.61$	1.16e-07
	Q14 (age)	$F(2,231) = 5.85$	0.0033
NB	Q5 (gender)	$F(1, 233) = 8.66$	0.0004
	Q8 (if used to visiting protected areas for recreation)	$F(1,233) = 27.98$	2.84e-07
	Q9 (number of visits to protected areas in the last two years)	$F(3,231) = 9.30$	7.9e-06
	Q14 (age)	$F(2,231) = 4.77$	0.0093

Post hoc comparison tests

Post hoc comparisons using the TK.test (Table 16) indicated that the NC mean score for females ($M = 4.6328, SD = 0.4526$) was significantly higher than for males ($M = 4.3852, SD = 0.6301$). The same can be inferred from the visits to protected areas. The NC mean score for those used to visiting protected areas was significantly higher ($M = 4.6341, SD = 0.4222$) than those not used to ($M = 4.1515, SD = 0.7421$). The number of visits to protected areas in the last

two years was also correlated with NC mean scores. All groups (one visit, two visits, or three or more visits) indicated a higher NC mean score than those who did not visit a protected area in that period. However, the results suggested that the NC mean score for those who visited protected areas three or more times ($M = 4.6500$, $SD = 0.4229$) was statistically significantly higher than for those who did not visit ($M = 4.1515$, $SD = 0.7421$) and those who visited only once ($M = 4.6000$, $SD = 0.3258$). Concerning participant's age, the comparison tests indicated that NC mean scores were significantly higher for those of the older group, from 50 to 69 years old ($M = 4.6667$, $SD = 0.6080$) than for those younger, from 18 to 29 ($M = 4.3805$, $SD = 0.6023$).

Table 16: Descriptive stats for NC scores and results of the post hoc comparisons for Q5, Q8, Q9, and Q14.

Variable	Group	n	NC post-experience scores			
			Minimum	Maximum	Mean	SD
Q5 (gender)	Female	128	2.3333	5.0000	4.6328 _a	0.4526
	Male	107	2.0000	5.0000	4.3852 _b	0.6301
Q8 (if used to visiting protected areas for recreation)	Yes	179	2.8333	5.0000	4.6341 _a	0.4222
	No	56	2.0000	5.0000	4.1515 _b	0.7421
Q9 (number of visits to protected areas in the last two years)	0 (no visits)	55	2.0000	5.0000	4.1515 _a	0.7421
	1	11	4.0000	5.0000	4.6000 _a	0.3258
	2	19	3.5000	5.0000	4.5263 _{ab}	0.4623
	3 or more	150	2.8333	5.0000	4.6500 _b	0.4229
Q14 (age)	18-29	99	2.3333	5.0000	4.3805 _a	0.6023
	30-49	108	2.3333	5.0000	4.6126 _{ab}	0.4602
	50-69	27	2.0000	5.0000	4.6667 _b	0.6080

Note. Means with no subscripts in common are statistically significantly different, $p < 0.05$.

The comparison tests for NB (Table 17) showed that the mean score for females ($M = 4.7437$, $SD = 0.3531$) was significantly higher than for males ($M = 4.5887$, $SD = 0.4526$). Concerning the visits to protected areas, the NB mean score for those used to visiting protected areas ($M = 4.7475$, $SD = 0.3327$) was significantly higher than those not used to ($M = 4.4328$, $SD = 0.5246$). The number of visits to protected areas in the last two years also influenced NB mean scores. All groups (one visit, two visits, or three or more visits) indicated a higher NB mean score than those who did not visit a protected area in that period. The results indicated that the NB mean score for those who visited protected areas once ($M = 4.7600$, $SD = 0.3373$) and those who visited three or more times ($M = 4.7507$, $SD = 0.3405$) was statistically significantly higher than for those who did not visit ($M = 4.4327$, $SD = 0.5246$). Participant's age also influenced NB mean scores, which were significantly higher for those of the older group, from 50 to 69 years old ($M = 4.8074$, $SD = 0.3485$) than for those younger, from 18 to 29 ($M = 4.5838$, $SD = 0.4451$).

The comparison tests for NB (Table 17) revealed that the mean score for females ($M = 4.7437$, $SD = 0.3531$) was significantly higher than for males ($M = 4.5887$, $SD = 0.4526$). Concerning the visits to protected areas, the NB mean score for those used to visiting protected areas ($M = 4.7475$, $SD = 0.3327$) was significantly higher than those not used to ($M = 4.4328$, $SD = 0.5246$). The number of visits to protected areas in the last two years also influenced NB mean scores. All groups (one visit, two visits, or three or more visits) indicated a higher NB mean score than those who did not visit a protected area in that period. The results showed that the NB mean score for those who visited protected areas once ($M = 4.7600$, $SD = 0.3373$) and those who visited three or more times ($M = 4.7507$, $SD = 0.3405$) was statistically significantly higher than for those who did not visit ($M = 4.4327$, $SD = 0.5246$). Participant's age also

affected NB mean scores, which were significantly higher for those of the older group, from 50 to 69 years old ($M = 4.8074$, $SD = 0.3485$) than for those younger, from 18 to 29 ($M = 4.5838$, $SD = 0.4451$).

Table 17: Descriptive stats for NB scores and results of the post hoc comparisons for Q5, Q8, Q9, and Q14.

Variable	Group	n	NB post-experience scores			
			Minimum	Maximum	Mean	SD
Q5 (gender)	Female	128	2.8000	5.0000	4.7437 _a	0.3531
	Male	107	2.6000	5.0000	4.5887 _b	0.4526
Q8 (if used to visiting protected areas for recreation)	Yes	179	2.6000	5.0000	4.7475 _a	0.3327
	No	56	2.8000	5.0000	4.4328 _b	0.5246
Q9 (number of visits to protected areas in the last two years)	0 (no visits)	55	2.8000	5.0000	4.4327 _a	0.5246
	1	11	4.0000	5.0000	4.7600 _b	0.3373
	2	19	4.2000	5.0000	4.7158 _{ab}	0.2774
	3 or more	150	2.6000	5.0000	4.7507 _b	0.3405
Q14 (age)	18-29	99	2.6000	5.0000	4.5838 _a	0.4451
	30-49	108	2.8000	5.0000	4.7222 _{ab}	0.3697
	50-69	27	3.4000	5.0000	4.8074 _b	0.3485

Paired t-tests on each item of the PEBI scale

Next, paired sample t-tests were conducted on each of the PEBI scale items to investigate which of the items showed a statistically significant difference between the mean scores considering pre-data and post-data, with a 95% confidence interval. The alternative hypothesis “true difference in means is greater than 0” was tested for each PEBI scale item since it was one of the main interests of the present research to find out if PEBI scores increased influenced by the experience in the park. Two items passed the tests, being one general pro-environment

behavior intention (Q19_4) and one parks-specific pro-environment behavior intention (Q19_7), as it can be seen in the table below.

Table 18: Paired t-test results for specific items of the PEBI scale.

Scale	Items	Statement	Pre		Post		t(234)	p-value
			Mean	SD	Mean	SD		
PEBI I have the intention of:	(Q19_4)	Reducing energy and water consumption	4.32	0.961	4.46	0.834	2.8719	0.004456
	(Q19_7)	Supporting parks, reserves, and other protected areas by volunteering my time	3.52	1.250	3.71	1.111	3.2707	0.001235

It is important to highlight that the participants expressed increased intentions to engage in both types of behaviors (general pro-environmental behavior and specific pro-parks behavior) due to the experience in the park. That result is extremely illustrative of the importance of visitation in protected areas to stimulate visitor's support for conservation and should be used to inspire Brazilian protected area managers to implement visitation. Concerning the item Q19_7 (support for parks through volunteerism), although that item had the lowest pre- and post-experience mean scores among all the individual PEBI scale items, the alternative hypothesis that tested that the true difference in mean scores was greater than 0 was statistically significant (considering the post-mean score minus the pre-mean score). That suggests that the experience in the park influenced the specific intention to support parks.

TESTING THE OVERALL MEASUREMENT MODEL

CFA was used to examine this study's overall measurement model fit and construct validity, using robust ML. Latent factors were standardized, allowing free estimation of all factor loadings. The number of free parameters is the number of observed variables times 2, plus the

number of covariances between the latent factors. This study's overall measurement model has three factors, six observed variables per factor, and three covariances between factors (Figure 8). Thus, there are 39 free parameters in the model, which requires a minimum sample size of $n=390$ to follow the standards suggested by prior research (10 participants per free parameter). The model was then tested using the pre-data ($n=471$).

The fit indexes showed that the model did not fit the data well (Table 19). Fit indexes were $TLI=0.894$, $CFI=0.908$, $RMSEA=0.061$ with 90% CI (0.051, 0.071), $SRMR=0.055$, and $\chi^2 = 283.296$ ($\chi^2/df=2.133$, $df=132$, $p<0.001$). All indicators showed statistically significant factor loadings, providing initial evidence of convergent validity, with standardized coefficients ranging from 0.443 to 0.824.

Table 19: Fit indexes for the overall measurement model using pre-survey data.

Data Type	χ^2/df	CFI	TLI	RMSEA	SRMR
Pre-data	$\chi^2=281.655$ $df=132$ $p\text{-value}=0.000$	0.908	0.894	0.061	0.055
	$\chi^2/df = 2.133$				

In terms of discriminant validity, which is the extent to which a construct is distinct from other constructs (Hair et al., 2014), the model was tested comparing the AVEs of each pair of constructs with the squared values of the estimated correlation between these constructs (Table 20). The idea is that a construct should explain the variance in the measures of its items, which should be more than the variance this construct shares with another construct. Discriminant validity requires that two constructs do not correlate too highly (not exceeding 0.85) if they are supposed to measure different phenomena. For NC, NB, and PEBI, AVEs are 0.396, 0.304, and 0.404 respectively. The correlation between NC and NB is 0.959, and the square of the correlation is 0.919. Thus, discriminant validity for these two constructs is not supported because

the AVE of both constructs is lower than their squared correlation. Considering that the NC scale has already been largely tested (Nisbet and Zelenski, 2013) and had its validity confirmed, the validity problem has probably to do with the NB scale's design, which should be revised. Based on these results, one can infer that both scales did not identify different constructs within the sample of participants. This result has implications for the hypothesized overall model, which will not be tested since there is a lack of discriminant validity between two of the exogenous variables.

Table 20: Correlation between constructs, squared correlations, and AVE.

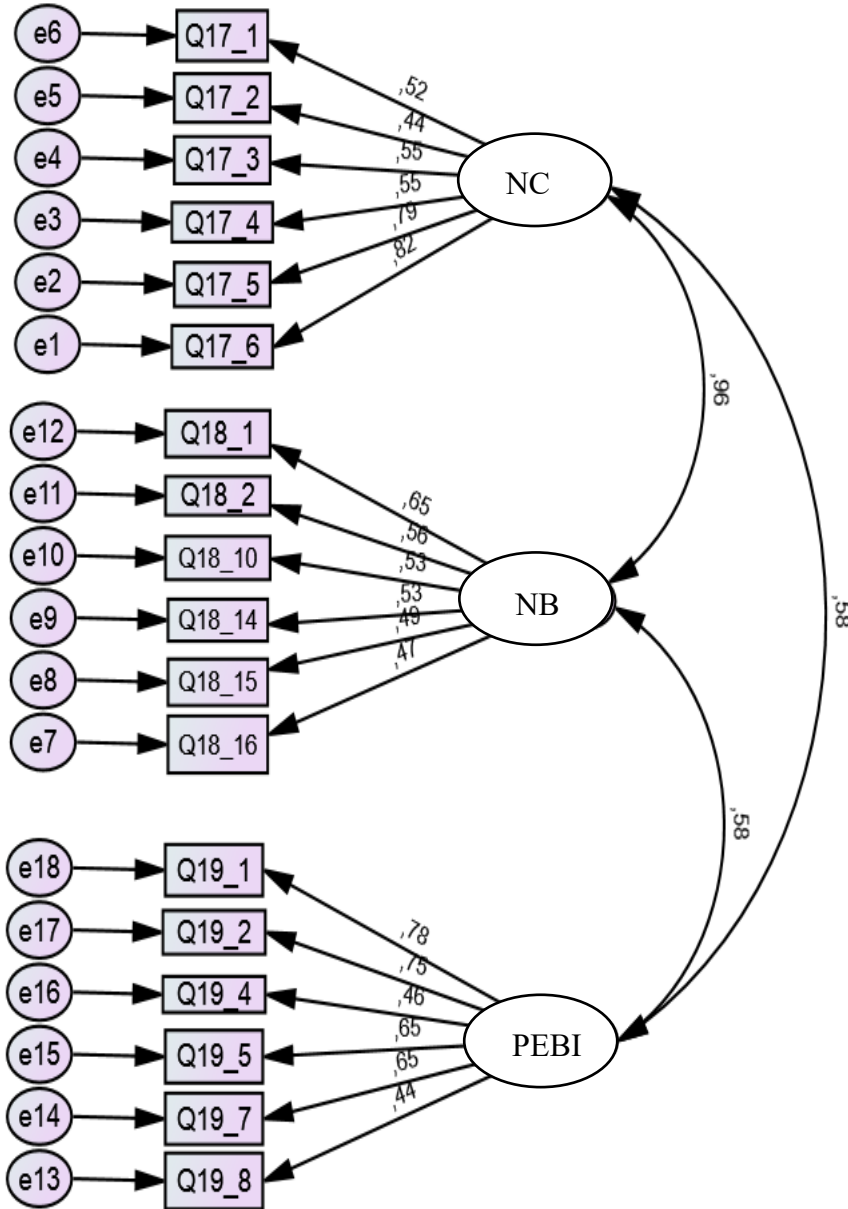
Construct 1		Construct 2	Correlation	Squared correlation	AVE
Nature Connectedness	←---→	Nature Belongingness	0.959	0.919	0.396
Nature Belongingness	←---→	Pro-Environment Behavior Intentions	0.585	0.342	0.304
Pro-Environment Behavior Intentions	←---→	Nature Connectedness	0.582	0.339	0.404

The correlation estimated between NC and PEBI was 0.582, and the squared correlation was 0.339, which is smaller than the AVE for NC (0.396) and PEBI (0.404). Thus, the discriminant validity of these two constructs was supported; there was a significant positive correlation between them, indicating that they grow together (i.e., participants who showed high nature connectedness were more likely to show high intentions of acting pro-environmentally).

One reason for the overcorrection of the latent correlations might be the low factor loadings. In the case of this study's overall model, there was one loading below 0.5 for the NC, two loadings below 0.5 for the NB, and two for the PEBI (Figure 8). The AVEs for the three constructs fell below the suggested level of 0.5, which could indicate that each construct could be improved by, for example, eliminating an item. The researcher overly tried this option, but no

improvement in any of the scales was achieved. Therefore, the three measurement scales were kept with six items each.

Figure 8: CFA results for the overall measurement model



The fit indexes for the overall model could have been improved by analyzing the modification indexes and including covariances between error terms of the same latent variable or still allowing cross-loadings (covariance between two error terms of items loading on different constructs). However, freeing these paths would threaten the constructs' validity (Hair et al., 2014; Cheng & Shiu, 2012). Analyzing the modification indexes, one can see that there is evidence that significant cross-loading exist, which is probably the main reason for the NB scale showing a lack of discriminant validity (Appendix 3).

TESTING THE RELATIONSHIP BETWEEN THE SUMMATED PEBI AND NC SCALES USING MULTIPLE LINEAR REGRESSION

Multiple regression was conducted to test the association between the summated scores for NC (the independent variable) and PEBI scale (the dependent variable), using the pre-experience data and adding the following covariates to the regression: Q5 - gender, Q7 - how many times in the park, Q9 - how many times recreating in nature in the last two years, Q10 - time spent in the park during the visit, Q14 - age, and Q16 - educational level. All of the covariates were dummy coded since they were categorical variables with two or more levels. NB was not added to the equation because of its high correlation with NC, which could certainly impact both the explanation and estimation of the regression results.

All the main assumptions that assured the data was suitable for multiple regression analysis were tested. The test for multicollinearity was done by checking the variance inflation factor (VIF) values for each variable. Those values should be below 5.00 (Ringle et al., 2015) to indicate collinearity was not a concern. All VIF values were below 5.00. An analysis of standard residuals was carried out, which showed that the data contained no outliers (Std. Residual Min = -2.771, Std. Residual Max = 2.760). Checking for independent errors, the data met the

assumption (Durbin-Watson value = 1.795). Next, the histogram and the P-P plot of the standardized residuals showed that their distribution was approximately normal. The scatterplot of the standardized residuals showed that the data met the assumptions of homogeneity of variance and linearity.

Using R version 3.6.2, it was found that NC and the covariates explained 33.3% of the variance in PEBI ($F(17, 451) = 13.25, p < .001, R \text{ square} = 0.333$). The analysis showed that NC significantly predicted PEBI (Beta (standardized coefficient) = 0.574, $t(451) = 11.049, p < .001$). The covariate Q9 also significantly predicted PEBI; it was dummy coded with four levels (Table 21), being the reference level “I am not used to visiting natural areas for recreation”, and the other three levels “I visited one natural area for recreation in the last two years” (Beta (standardized coefficient) = 0.124, $t(451) = 2.903, p = 0.004$), “I visited natural areas for recreation twice in the last two years” (Beta (standardized coefficient) = 0.133, $t(451) = 2.943, p = 0.003$), and “I visited natural areas for recreation three or more times in the last two years” (Beta (standardized coefficient) = 0.135, $t(451) = 2.631, p = 0.008$). Therefore, results provided evidence that there is an increase in PEBI for those who are used to recreating in protected areas relative to those who are not used to it (all the other variables kept constant).

Table 21. Regression table of the association between NC, PEBI, and the covariates Q5, Q7, Q9, Q10, Q14, and Q16, using pre-experience data (n=471).

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	
	B	Std. Error	Beta			
PEBI~NC	(Constant)	1.709	0.319		5.348	0.000
	NC total score	0.574	0.052	0.493	11.049	0.000
	Gender					
	Q5=Male	0.025	0.051	0.020	0.492	0.622
	Times in the park					
	Q7=Twice	-0.093	0.081	-0.046	-1.138	0.256
	Q7=Three	-0.000	0.121	-0.009	-0.002	0.998

Q7=Four or more	0.051	0.056	0.039	0.911	0.362
Times in other protected areas in the last two years					
Q9=One	0.377	0.129	0.124	2.903	0.004
Q9=Two	0.269	0.091	0.133	2.943	0.003
Q9=Threeormore	0.173	0.066	0.135	2.631	0.008
Time spent in the park on the day of the research					
Q10=Medium (3-6)	0.068	0.067	0.047	1.012	0.312
Q10=Daylong (6-9)	0.036	0.076	0.022	0.473	0.636
Q10=Overnight	0.016	0.069	0.011	0.242	0.809
Age					
Q14=30-49	0.069	0.055	0.055	1.245	0.214
Q14=50-69	-0.083	0.084	-0.042	-0.986	0.324
Q14=70-89	-0.377	0.273	-0.055	-1.382	0.167
Educational level					
Q16=Medium	-0.331	0.243	-0.211	-1.362	0.195
Q16=Undergrad	-0.310	0.239	-0.247	-1.296	0.195
Q16=Graduate	-0.309	0.242	-0.217	-1.278	0.202

The other tested covariates were not statistically significant, meaning that there is not enough evidence that there is an association between those variables and the shifts in the PEBI score.

TESTING THE RELATIONSHIP BETWEEN PEBI AND NB USING MULTIPLE LINEAR REGRESSION

Multiple regression was conducted to test the association between NB (the independent variable) and PEBI (the dependent variable), using the pre-experience data (n=471) and adding to the regression the same covariates as those tested in the section above: Q5 - gender, Q7 - how many times in the park, Q9 - how many times recreating in nature in the last two years, Q10 - time spent in the park during the visit, Q14 - age, and Q16 - educational level.

All the main assumptions that assured the data was suitable for multiple regression analysis were tested and verified. Results showed that NB and the covariates explained 30.2% of

the variance in PEBI ($F(17, 451) = 11.48, p < .001, R \text{ square} = 0.3021$). The analysis showed that NB significantly predicted PEBI (Beta (standardized coefficient) = 0.432, $t(451) = 9.833, p < .001$). It was also demonstrated that PEBI was significantly predicted by the covariate Q9, which was dummy coded with four levels (Table 22): the reference level was “I am not used to visiting natural areas for recreation”, and the other three levels were “I visited one natural area for recreation in the last two years” (Beta (standardized coefficient) = 0.144, $t(451) = 3.293, p = 0.001$), “I visited natural areas for recreation twice in the last two years” (Beta (standardized coefficient) = 0.138, $t(451) = 2.984, p = 0.003$), and “I visited natural areas for recreation three or more times in the last two years” (Beta (standardized coefficient) = 0.168, $t(467) = 3.241, p = 0.001$). Again, results provided evidence that there is an increase in PEBI for those who are used to recreating in natural areas relative to those who are not used to it (all the other variables kept constant).

Table 22. Regression table of the association between NB, PEBI, and the covariates Q5, Q7, Q9, Q10, Q14, and Q16, using pre-experience data ($n=471$).

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
PEBI~NB (Constant)	0.942	0.396		2.375	0.017
NB total score	0.692	0.070	0.432	9.833	0.000
Gender					
Q5=Male	-0.007	0.052	-0.005	-0.130	0.896
Times in the park					
Q7=Twice	-0.135	0.084	-0.067	-1.609	0.108
Q7=Three	0.017	0.124	0.006	0.141	0.888
Q7=Four or more	0.104	0.057	0.081	1.833	0.067
Times in other protected areas in the last two years					
Q9=One	0.437	0.133	0.144	3.293	0.001
Q9=Two	0.279	0.094	0.138	2.984	0.003
Q9=Threeormore	0.215	0.066	0.168	3.241	0.001
Time spent in the park on the day of the research					
Q10=Medium (3-6)	0.059	0.068	0.040	0.859	0.391

Q10=Daylong (6-9)	0.010	0.078	0.006	0.127	0.899
Q10=Overnight	0.043	0.070	0.030	0.609	0.543
Age					
Q14=30-49	0.099	0.056	0.079	1.769	0.077
Q14=50-69	-0.016	0.085	-0.008	-0.195	0.845
Q14=70-89	-0.388	0.279	-0.057	-1.388	0.165
Educational level					
Q16=Medium	-0.253	0.248	-0.161	-1.017	0.309
Q16=Undergrad	-0.257	0.245	-0.205	-1.052	0.293
Q16=Graduate	-0.227	0.247	-0.159	-0.919	0.358

The other tested covariates were not statistically significant, meaning that there is not enough evidence that there is an association between those variables and the shifts in the PEBI score.

QUALITATIVE RESULTS

As explained in the Methods Section, qualitative data (the ESM and the interview data) were analyzed using a Grounded Theory approach (Corbin & Strauss, 2008). This approach is focused on building theory from the data through constant comparison, interpretation, and open coding until exhausting the emerging themes possibilities. The theory is built by identifying relationships between the themes.

The ESM data and interview data were carefully examined and analyzed; conceptual names (themes and subthemes) emerged from the analysis to represent the data through interviewees' idea patterns until the exhaustion of those patterns. Original quotes were presented to support the analysis and illustrate the patterns in the data.

ESM DATA ANALYSIS

Participants were asked to download an app-based data collection instrument (Survey123 for ArcGIS) on their Smartphones, take four pictures of memorable moments during their visit

using their Smartphones' built-in cameras, and upload the photos into the app. The pictures worked as triggers to stimulate participants to comply with the protocol. After each shot, they were asked to answer three open-ended questions: 1) Why did you choose this image to represent a memorable moment of your visit? 2) What does this image convey to you? 3) What do you like most about the place you are now?

Only 54 of the 151 participants who answered the three ESM questions mentioned above also participated in two other phases of this research (the pre-trip and post-trip surveys). Those 54 people were distributed into groups 1, 2, and 3 (Table 23), based on their post-trip PEBI scores compared with their pre-trip scores (I=increase=group 1, D=decrease=group 2, N=neutral/no change= group 3), and the data organized in a table found in Appendix 4. The analysis tried to uncover insights about participants' experiences that could explain the change in PEBI scores, i.e., information that could shed light on the trip's critical aspects that could have influenced the results.

Of the 106 participants who scored higher in PEBI after their experience in the park compared with their score before the visit, 32 answered the ESM questionnaire and uploaded an average of three pictures each to the app database. This group contains a larger number of participants than the other two groups.

Of the 70 participants who had a decrease in PEBI scores after their experience in the park, 10 participants answered the ESM questionnaire, and uploaded an average of two pictures each to the app database.

Of the 59 participants who reached the same PEBI scores before and after their experience in the park, 12 answered the ESM questionnaire. They uploaded an average of three pictures each to the app database.

Table 23: Number of participants per group and ESM questionnaires answered.

Group	Comparison between post and pre-trip PEBI total scores by matched pair	Number of observations	Number of participants who answered the ESM questionnaire
1	Increase	106 (45%)	32 (59%)
2	Decrease	70 (29%)	10 (19%)
3	No Change	59 (26%)	12 (22%)
	Total	235 (100%)	54 (100%)

A Grounded Theory approach was used to analyze the data. Similarities and differences were found in the data by continually comparing indicators, which led to the themes and subthemes that emerged from the data when analyzing the answers to the three questions listed in this section's first paragraph. The findings were organized around nine main themes: 1) The greatness and values of nature; 2) Nature's details; 3) Clean water; 4) A sense of accomplishment; 5) Contact with nature; 6) A friendly and welcoming environment that strengthens the group's bonds; 7) The good feelings; 8) Respect and admiration for nature, 9) The experiences' negative aspects. Original quotes were presented to support the themes and subthemes. After each quote, there is an indication of the participant's PEBI score behavior after the park experience (I=increase; D=decrease, and N=neutral/no change).

Theme 1 – The greatness and values of nature

Theme 1 was the most relevant for all three PEBI groups described in Table 23. Participants affirmed being overjoyed by the park's stunning nature, the imposing mountains, the incredible landscapes, and beautiful scenes like sunsets and sunrises. The aspects mentioned by participants directly relate to the park's nature conservation status and the opportunities for outdoor recreation available for different visitor profiles, which allow them to have meaningful experiences. The following subthemes emerged from the data and demonstrated that participants got emotional before the force and beauty of nature:

1.1 Realizing the smallness of humankind.

"I like the feeling of being at the highest point of the mountain and realize how small we are in the face of nature." (D)

1.2 Testifying the divine creation.

"We finally arrived at Açu ... Incredible view. Wind, sun, God in his best expression. The connection with divine art." (I)

"I am at the "Thanks to God" sign, and although I am not religious, the phrase touched me somehow. Indeed, there must be a greater power capable of creating something so beautiful." (I)

1.3 Appreciating the preserved nature's beauty.

"What strikes me is the preserved nature's beauty." (I)

"The arrival at the summit is always amazing!!! And shows unparalleled beauty!" (N)

1.4 Feeling the power of nature.

"An incredible view on the horizon and life sprouting between the rocks. Two great examples of the force of nature." (I)

"I feel the power of nature, which is capable of unimaginable things! I've never felt such a strong wind!" (I)

1.5 Admiring the imposing landscape.

"I have chosen this image because it represents this park's immensity, the joy of seeing the sunset, and have achieved a goal." (D)

"The image shows the grandeur of the Garrafão Stone. Superb, strong image." (D)

"The sentiment that the end is not always a negative feeling (this was the most exuberant end of the day/sunset I have ever seen)." (D)

"I found the view very beautiful - I like to see and feel nature's immensity." (N)

1.6 Respect and admiration for nature.

"The importance of caring for mother nature." (N)

"The photo conveys respect and admiration for nature." (I)

Theme 2 - Nature's details

The three groups reported being amazed at nature's details, the sounds and the smell of nature, the wind, the vegetation, the trees, the flowers, the wildlife, and the colors of nature. However, Theme 2 was most valorized by participants who scored higher in PEBI after their trip to the park.

2.1 Listening the sounds of nature.

"I like the sounds of nature, the wind, the birds, and the water." (I)

"I like to be able to satisfy my senses in this healthy environment, with the soft sunshine shining between the trees and the sound of birds and water." (I)

2.2 Smelling nature's smell.

"I like the sound of the waterfall, the birds singing, the trees' beauty, and nature's smell." (I)

2.3 Noticing the vegetation.

"I like being able to look at the trees closely and from different angles." (I)

"I chose this image because I stopped walking only to admire this plant, so different and beautiful! It is different from all I have seen!" (I)

"I found the shape of this plant unique; it seems like a flower. I am excited to be still able to see and perceive beautiful things, even though I am so tired." (N)

"I found the sunlight on the foliage beautiful." (D)

"I'm on the trail to Pedra do Sino, and the photo of this flowered bromeliad reflects my connection with nature." (I)

2.4 Seeing wildlife.

"I chose this photo because of the possibility of seeing wildlife in its natural habitat." (D)

"Because the sign explains about coatis and there is a possibility to see them here." (I)

Theme 3 - Clean water

Theme 3 was highlighted by those who had an increase in PEBI scores after the park experience (group 1). This group seemed to be more mindful of the importance of preserving clean water and the park's role in making that happen. Besides that, it was important for this public to enjoy the water in peaceful places, and the sound of running water.

3.1 Preserving clean water.

"The image represents the preservation of drinking water for the planet." (I)

"Because water is a precious asset that we must preserve." (I)

3.2 Enjoying the water.

"Because the image reveals the purity of the water." (I)

"I feel very good at watching waterfalls and listening to water sounds; it is a reassuring feeling." (I)

"I like the sound of running water; I found this place beautiful." (I)

Theme 4 - A sense of accomplishment

Overcoming a challenge by hiking a strenuous trail in the park or hiking several trails on the day of the visit made participants feel proud of themselves, have a sense of accomplishment, feel the joy of achieving a goal, and feel nature as a friendly environment. The quotes below represent the three PEBI groups, but Theme 3 was most cited by groups 2 (decrease) and 3 (neutral).

4.1 Overcoming a challenge.

"The image means the outcome of a day full of challenges overcome." (D)

"I liked the feeling of overcoming a challenge; I mean, I have managed to get to the lookout point of the 360 Trail." (N)

4.2 Being able to.

"The altitude I managed to climb shows me that with persistence, everything is possible." (N)

"This photo shows that we reached our goal to arrive at Pedra do Sino with just two stops to rest along the way. Now let's go down." (D)

"I liked the place and had a sense of accomplishment for hiking the trail." (I)

4.3 Enjoying the adventure atmosphere and expectation.

"I love being able to walk the rocks along the river to discover new places; it is an adventure." (I)

"This image indicates the beginning of the adventure." (N)

4.4 Finding satisfaction and gratitude.

"I have the willingness to thank nature for being here having this experience." (I)

"This image represents achievement and satisfaction for having hiked the trail and arrived at Açu." (D)

"The image conveys joy for having climbed up the mountain." (N)

Theme 5 - Immersed in nature, having the good feelings.

Respondents from the three groups mentioned that feeling immersed in nature was one aspect to be highlighted. Especially participants from groups 1 and 2 acknowledged good feelings as a consequence of having that contact: being at peace, tranquil, in harmony with the environment, calm, reenergized, relaxed, and disconnected from everyday issues were aspects that participants reported as important to help them feel the park's environment, as shown below:

5.1 Integrating with nature.

"I like the way the forest surrounds the Suspended Trail. We really feel inside the dense forest, being part of that environment." (I)

"I chose this picture because of the integration with nature that the Suspended Trail provides." (D)

5.2 Feeling at peace, tranquil, in harmony, and calm in nature.

"I like being at peace and harmony with nature." (I)

" I like the peaceful place and to feel in harmony with nature; those aspects work to elevate my soul." (I)

" The image of the forest and the blue sky contrasting with the green transmits calm." (D)

"I like to get into the water and relax in this very peaceful place." (I)

5.3 Living a reenergizing experience.

"I like to be here because I feel reenergized and at peace in this environment." (I)

5.4 Disconnecting from everyday problems.

"What I like the most is the distance I feel from everyday problems." (D)

"I like this place in the park because in here I stop thinking about my life's problems." (I)

"What I like most is being able to disconnect from the urban routine and be in contact with nature." (D)

Theme 6 - Promoting a sense of freedom, love, and happiness

Participants reported a sense of freedom due to being in nature. The quiet environment, where only the sounds of nature could be heard, stimulated the interaction with nature and awakened feelings that reinforced their nature relationship, such as inner peace, freedom to be and act, love for life, joy, and happiness.

"I like the silence and the good smell the forest has." (I)

"The image conveys freedom to be and act, respect for everything that exists, love for others. Life!" (I)

"I have a sense of freedom when I am in nature. This is what I like the most." (N)

"The image conveys the joy of living!" (D)

Theme 7 - A friendly and welcoming environment that strengthens the group's bonds

Participants suggested that the park's environment is welcoming and that the structure to support visitation helped them enjoy the experience. For them, the joy of the group for being in

nature strengthened the group's bonds and made them feel in communion with the group and the mountain.

7.1 Promoting fellowship and group union (aspect highlighted by groups 1 and 2).

"The image conveys peace and communion with the group and the mountain." (D)

"The feeling of relief at having passed the point of the trail called the elevator, and the spirit of companionship between my group and me. I feel ready for more adventures with them!" (I)

"Place of trekkers' gathering and fellowship." (I)

7.2 Feeling welcome (aspect highlighted by groups 1 and 2).

"Feeling welcome by the shelter's staff and other hikers in our moment of rest after long walks." (I)

"I am at the park's entrance gate, being very welcome." (D)

Theme 8 - Good structure to support visitation (aspect highlighted by groups 1 and 3)

"Because I wanted to show that everything is very well signposted." (I)

"I chose to photograph the Suspended Trail because I found the idea of the trail really cool." (I)

"This image shows the park's care with the trail." (N)

"What I like most is the easy access to the park and the good organization." (N)

Theme 9 - The negative aspects

Only two participants reported something negative about their experience in the park. However, none of them was a participant from group 2 (decrease in PEBI score after the trip), making it difficult to connect a perceived negative aspect of the visit with the reasons that might have led to the reduced interest in responsible environmental behavior. The two examples are as follows:

"I did not like the scene I have just witnessed (coatis eating garbage from a trash can)." and "We found a plastic bag stuck in the roots of the trees, inside the river." (I)

"I was a little disappointed that the Suspended Trail was closed." (N)

Summary of the ESM data analysis results

Participants were asked to take four pictures of memorable moments during their visit to Parnaso; those pictures worked as triggers to stimulate participants to comply with the ESM protocol and answer three open-ended questions after each shot. It was supposed that the answers would give the researcher some information about what participants valued most during their experiences in the park.

Nine main themes emerged from the data, and around them, many subthemes. After each original quote presented to support the themes and subthemes, there is an indication of the participant's PEBI score after the park experience compared with his/her score before the experience (I=increase=group 1; D=decrease=group 2; N=neutral/no change=group 3). By analyzing this way, it was possible to suggest which subthemes were most valued by each PEBI score group mentioned above.

The first theme, **the greatness and values of nature**, was the most relevant for all three PEBI groups. Participants were amazed by the park's nature conservation status and the opportunities for outdoor recreation, which allowed them to have meaningful experiences. They affirmed being overjoyed by the park's stunning nature and got emotional before nature's power and beauty. Groups 1 and 3 highlighted the respect they feel for nature and the importance of caring for the natural environment, giving rise to the subtheme **respect and admiration for nature**.

The second theme, **nature's details**, was most valorized by participants from group 1. They felt excited to hear nature's sounds and breathe its smells, besides noticing the vegetation's details such as a specific flower, tree shape, or tree leaf's texture, besides being amazed at seeing

wildlife. The same group also highlighted the third theme, **clean water**, as an aspect of the experience in the park that amazed them (to enjoy the water and the sound of running water) and made them think of the park's role in preserving such an important asset.

The fourth theme, **a sense of accomplishment**, was most valorized by groups 2 and 3. Participants felt the joy of overcoming a challenge by hiking a strenuous trail or achieving a goal by hiking several trails in the park on the day of the visit. Those feelings made participants feel proud of themselves and had a sense of accomplishment, resulting in feeling nature as a friendly environment.

All three groups emphasized that having contact with nature and feel **immersed in nature** (the fifth theme) were significant. Except for group 3, the two other groups went further and explored the consequences of having that contact. They mentioned they felt re-energized, relaxed, and at peace having contact with nature. Some of them affirmed that what stimulated them to take the picture was the silence, the peace, and feeling immersed in nature, making them feel part of that environment. Another consequence of being immersed in nature seemed to be that participants felt disconnected from everyday issues, making them feel well and relaxed.

Participants from the three groups acknowledged **a sense of freedom, love, and happiness** (the sixth theme) due to being in the park. The quiet and preserved park's environment and the paths through the forest, where only the sounds of nature could be heard, stimulated their interaction with nature. That experience awakened feelings such as inner peace, tranquility, harmony, calm, freedom to be and act, love for life, joy, and happiness.

Feeling welcome in the park and the joy of being in nature with friend groups was emphasized by groups 1 and 2; the answers also suggested they might have strengthened the bonds with friends by living that experience together. The aspects above gave rise to the seventh

theme, **a friendly and welcoming environment that strengthens the group's bonds**, which delighted those visitors and contributed for them enjoy the experience.

Except for group 2, participants valued the easy access to the park and the good structure to support visitation, which they pointed out is well managed (Theme 8 - **Good structure to support visitation**).

Only two participants from groups 1 and 3 reported something negative about their experience in the park (the ninth theme, named **the negative aspects**): wildlife eating garbage from a trash can and the fact that part of one famous trail was closed maintenance. Therefore, it was impossible to realize and connect a reported negative aspect with a decrease in PEBI score after the trip, making it difficult to understand what might have led to the reduced interest in responsible environmental behavior.

Therefore, concerning the three PEBI groups, it is possible to highlight that group 1 (increase in PEBI score) were those able to pay attention to nature's details and seemed to be more mindful of the importance of preserving clean water and the park's role in making that happen. A feeling of accomplishment was most important to groups 2 (decrease) and 3 (neutral). Only group 3 did not mention that being immersed in nature made them feel integrated, re-energized, relaxed, and disconnected from everyday issues. And only group 2 did not highlight respect for nature.

FOLLOW UP INTERVIEWS

Twenty-seven participants were interviewed by telephone, one week after their experiences in the park; two of the interviews were pretest and are excluded from this analysis. The objective, as specified in the Methods section, was to gather information on participants' experiences in the park that could clarify and improve the analysis, providing the depth of understanding that the

quantitative analysis lacked concerning the experience in a protected area and its relationship with the constructs BC, NB, and PEBI.

Seven questions composed the interview guide, as shown in Table 2. Answers of the 25 participants were then analyzed using the Grounded Theory approach (Corbin and Strauss 2008). The findings were organized around the questions and according to the six main themes that emerged from the data through open coding: 1) Influence of the park experience in nature connectedness; 2) Influence of the park experience in nature belongingness; 3) Aspects of the outdoor experience that improve nature connectedness; 4) Aspects of the outdoor experience that enhance nature belongingness; 5) Influence of the outdoor experience in a protected area on general pro-environmental behavior; 6) Influence of the outdoor experience on support for protected areas.

Under the main themes, diverse subthemes were grounded to organize the data. Original quotes were presented to support the analysis; they illustrate the patterns found in the data. Interviewees were given a pseudonym to protect their anonymity.

Theme 1. Perspectives on the influence of the experience in the park on connectedness

Most interviewees (19 people of 25) declared that each one of the recreational experiences they had in protected areas, including that one in Parnaso, improved or reaffirmed their connection with nature, demonstrating that being connected is a process and not a one-off event. Five participants affirmed that the visit to Parnaso did not make much difference in their connection. Only one participant argued that the experience might not have any influence on connectedness. Moreover, some participants attributed the development of their connectedness to other reasons than visiting a protected area and stated they were already connected to nature before visiting Parnaso. Thus, based on participants' perspectives on connectedness improvement

(or no improvement), six subthemes were created to accommodate their views on aspects of the visit that could stimulate connectedness, as shown below:

1.1 Strengthening nature connectedness as a result of a recreational experience in a protected area.

Participants reported different perceptions about the improvement of their nature connectedness; for some of them, there were no doubts about the influence of the experience on that feeling. Dorothy argued that each visit works to reaffirm nature connectedness and a taste for the natural environment:

"I think that each visit to a park works to reaffirm the connection because usually the person who goes to a park already likes this type of place, this type of environment, nature, waterfalls, water. So, I think the visit serves to reaffirm this contact with nature, this taste for the natural environment."

Nelson argued that even for those who are used to visiting parks, each visit might stimulate a stronger connection with nature:

"I think that whenever we go to a natural area, no matter how much we are used to going, there is a connection, a stronger connection. We leave an urban place to go to a forest place, and certainly, the visit strengthens the connection and makes it stronger."

Paul recognized that visits to protected areas have a significant influence on connection:

"I think the visit has a significant influence on how people connect with nature. At least for me, it works like that."

Paul asserted that the visit made him feel closer to nature. He explained he invited his children to visit the park so that they also had the opportunity to enjoy nature, which might influence them to invite their children in the future as well:

"For me, contact with nature is super important... The visit greatly influenced how I connect with nature because I felt like being closer to nature. I took my kids, so they also had the opportunity to get closer to nature. So, I influenced them directly in that part, and in the future, they may be taking their children to visit the park."

Thais highlighted she had invited friends to enjoy Parnaso stimulated by the amazing experience she had in the area:

"The experience in the park connected me more with nature. I cried because I was too emotional while hiking the trail, which I found very beautiful, fantastic. Look, I came home and already invited some friends; we are scheduling, and I will take a group of friends to the park. I don't even have words to describe how I felt there... I am encouraging people to visit parks."

Some interviewees related improvements in their connection with nature to the status of conservation of the protected area. Francis is an example of that:

"When I visited Parnaso and found it in excellent condition, it made me even more connected to nature."

Nick pointed out that the air, the wind, everything is different inside a park because of nature's preservation, which stimulates an improvement in visitors' nature connectedness and a disposition to visit other protected areas:

"I like visiting parks. I have visited a lot of them. My first visit to a park was to Tijuca National Park in Rio. I really enjoyed the experience, and after that, I started visiting other parks. I mean, the air, the wind, everything is different inside a park and stimulates a greater connection with nature."

Renato contended that the visit to Parnaso made his friends and himself want to know other natural areas and sparked their interest in knowing more about nature:

"What happened to my colleagues and me was that, after visiting the national park, the visit aroused our desire to visit other natural areas. We are already planning to hire a guide to hike the Petrópolis-Teresópolis trail. We are also planning to get to know other trails because it sparked our interest in knowing more about nature. It is not just about walking but observing all the beautiful things we do not see daily."

Robert affirmed that the visit to a national park has the power to work as a watershed in visitors' lives because then they start understanding nature better and feeling the positive impacts of nature in their lives:

"When the person comes from a big city and visits a beautiful place like a national park, that visit works like a watershed in his life. The person starts understanding the natural

environment because then he starts breathing better, his hearing becomes better, so all those things impact that person. He starts feeling the positive effects of being in nature. In my particular case, each experience reaffirms and increases my connection with nature."

Mike also highlighted the positive impacts of nature in visitors' lives since he argued that advances in connectedness are a consequence of feelings of wellbeing in the natural environment:

" Being in a park as Parnaso generates a kind of wellbeing that brings people closer to nature. Then the connection should increase."

Nelson contended that the high reported nature connections among participants might result from them being in the protected area when researchers approached them. He suggested that the results could be different if the researchers had interviewed the same people somewhere else (in a mall, for example). In his perspective, what influenced the high self-declared nature connection of participants was that they were in the park when they were interviewed. He said:

"I don't think visitors felt connected to nature because they were already connected before going to the park. They felt connected precisely because they were inside the park."

1.2 Being connected to nature before the visit to the park and even so noticing an improvement in connectedness.

Some interviewees stated they were already used to visiting that kind of environment before the trip to Parnaso, and as such, they were already connected with nature. Despite that, the experience worked somehow to reaffirm and improve that relationship. Peter reported a sense of nostalgia when he was in Parnaso, a good feeling for his childhood in the park, for the green, the forest, for that environment:

"In my case, there was already a connection with nature. I grew up in Teresópolis, very close to the park, and I used to go there with my friends to enjoy the waterfalls. When I was 18, I moved to Cabo Frio, which is a city by the sea. Teresópolis is a city by the mountains, and Cabo Frio is a beach town. They are different environments when it comes to wildlife and the forest. In Teresópolis, I can feel the green, the forest, much more than here in Cabo Frio. When I visited the park, I felt a sense of nostalgia for that environment, for my

childhood, the green, the Atlantic forest, the wildlife. And that feeling... it was like I was meeting my expectations, and that gave me the support I expected and reinforced my nature connection."

Elza affirmed having a strong connection with nature, which was a consequence of many national park visits; for her, her nature connectedness has been improving throughout her life:

"In my case, I already had this solid connection with nature. I usually do outdoor activities, at least once a month, so I think I already have a relationship with nature, you know? I think it was because of my connection that I had a very high score in your research. But the experience helps improve my nature connectedness because going to national parks is something I have done since I was a child. So, my connection has been improving throughout my life." and "The last experience at Parnaso helped, too. And I want to continue to get closer to nature because I know that having several and different experiences will increase my connection."

Francis explained that he felt connected to nature before the trip to the park, but still, the visit strengthened that connection. He related the reason for that improvement to the park being very well conserved:

"I already felt connected to nature before, but I think the experience was perfect for me in that sense. I have visited some national parks abroad, and I had no idea that we had one national park so well maintained and conserved. I felt terrific, and it connected me to nature even more. I am sure that each new experience strengthens that connection."

1.3 Having an improvement (or no improvement) in connection with nature is a function of the number of visits (or how used a person is to the natural environment).

Some participants asserted that improvements in a relationship with nature may not happen (or might be small) for those already used to the natural environment. Robert explained that the experience did not improve his connection because he was already used to visiting the park. In his perspective, visitors who are not used to outdoor recreation might feel more improvement in their nature connectedness as a result of an experience in nature:

"In my case, the experience at Parnaso didn't make much of a difference in my connection with nature because I was very adapted to that park. The less the person is used to the natural environment, the more the experience will make a difference in his life."

Rita corroborated Robert's perspective pointing out:

"I think that for most people who frequently go to Parnaso, the experience ends up not improving their connection with nature that much because they are already used to that environment. Their connection may improve, but not that much. And if a person does not like [being in nature] but ends up visiting a park anyway, I don't think the experience will stimulate a connection."

Kathia affirmed that the experience did not influence her nature connectedness because she is a biologist very used to the natural environment. She suggested the researcher should include in the survey a question about the respondent's occupation, which would help to understand the participant's perspective on connectedness:

"So, I think it would be important for you to include a question about the person's occupation in your research. For example, because I am a biologist, my perspective is a little different. The natural environment is my normal workplace, and I am used to it; I am really interested in nature. So, the experience does not influence my nature connection or how I see and act in this environment."

Tom observed that, for those who were not feeling comfortable or were not used to the natural environment, some park's trails might have hindered the strengthening of their connection:

"Some people who were with us on the trail seemed not to have a connection with nature and even said that it would take time to do another activity of that kind. I think they did like to hike that trail, but it was a very challenging hike, which may have hindered the strengthening of their connection with nature."

Mary, however, affirmed that her experience in the park had a positive impact on her nature connectedness and suggested it happened because she was a first-time visitor:

"This trip to the park made a big difference in my nature connection because it was the first experience of my life in a park."

1.4 Having no change (or small change) in connection as a result of a recreational experience in a protected area.

John argued that people who visit a park (and especially those who agree on answering research questionnaires) already have their opinion formed concerning their relationship with nature, which should not be influenced by the experience.

"I think that people who visit a park already have their opinion formed concerning their relationship with nature. I mean, the person who chooses to enjoy a park in his leisure time already has some connection with nature. It may even be that the visit slightly improves the connection. But those who go to parks and, especially, agree on answering questionnaires, I think they already have a predisposition to enjoy nature, so the connection should not change that much."

1.5 Feeling oneself nature connected is a consequence of factors other than visitation.

Some participants reported they do not necessarily need to be in a park to be connected to nature; feeling connected can result from family recreational activities in natural environments, childhood in nature, or living in a county surrounded by nature. Ryan explained:

"My mother loves to take pictures of the sky, the colors of the sky and clouds. We love to stay in the garden watching birds, a toucan. My grandfather also liked to observe and analyze the landscape. So, we created the habit of this daily interaction, not necessarily because of the park. That made me respect the environment; my mother always taught me."

Francis said he lives in a city surrounded by nature, which has facilitated his access to natural places and stimulated his nature connectedness. He affirmed that that proximity with nature makes him feel great physically and psychologically.

"I feel very close to nature, and I feel great, both physically and psychologically. It's a good time for me when I am in nature. I currently live in Angra dos Reis, close to the beach, and my house is surrounded by nature. The place is very green. I've lived here for four years, and I think that this fact made me pay more attention. Moving to Angra has facilitated my access to nature, and then I started a closer connection and wanted to visit other parks. Since I moved here, I started hiking more trails and going out to enjoy other natural places. So, the fact that I moved here generated more connection and more desire to visit other sites of this type."

Sandra affirmed that visiting parks had not influenced her connection with nature at all.

The influence has come from her place of living, from her county's green culture:

"No, I do not think it has to do with trips to natural areas such as parks. I have learned to connect with nature, especially from the moment I came to live in this city, and this feeling has become more intense due to the influence of the local culture."

Tom argued that he did not change his connection scores that much because he already had feelings of belonging and connection to nature:

"There was not much change in my connection scores because when I went to Parnaso, I already had that feeling of belonging and connection to nature... In my case, I have always lived in rural areas. I was born in the state of Tocantins, in a small town. There was always a natural place to go near us, so I grew up nurturing this connection with nature."

Theme 2. Perspectives on the influence of the experience in the park on nature

belongingness

Interviewees connected feelings of belonging to visiting more to know the place more, participating actively in the experience, and letting the instincts take over. All of those would make them feel part of that environment.

2.1 Visiting natural areas more times to feel a sense of belonging.

Peter acknowledged his sense of belonging increases each time he goes to Parnaso; it is like relying on the familiar and nurturing a sense of nostalgia. Each time he visits the park and learns more about the place, he feels like taking part in that environment, his environment, the region where he grew up:

"Although I have visited the park many times, I have always expected to get back to know more about this region, my region, where I grew up. So, I got to know new trails over the years. The last time I went to the park, many people talked about a trail that I had not heard about before. Then I thought: I am from the region, and I had not felt that sense of belonging because I had never been to that part of the park. People were talking about the Postcard Trail. Then I went there, I hiked that trail, and I reached my goal. There are other trails that I intend to do and have this sense of belonging."

Rita argued she got the taste for being in nature after she went through unique experiences in natural areas; those experiences made her feel part of that environment:

“I think I ended up getting the taste for being in nature when I went through the unique experiences; I mean, even if I visited the same place, things have never happened the same way. That day when I went to the park, the sky was amazing, so different... When I am in the bush, I feel very comforted; I feel as taking part in that environment.”

John suggested that recreational experiences in natural areas might increasingly bring a person’s sense of peace and comfort:

“I believe that the visit will increasingly bring a greater sense of peace and comfort, which greatly benefits a person’s wellbeing.”

Sarah affirmed that experiences in the natural environment, like the one she had in Parnaso, make her feel each time more comfortable and in harmony with that environment:

"Every time I go to a place like Parnaso, I feel more comfortable in that environment, more peaceful, harmonized; I think there is nothing better than that."

2.2 Participating actively in the outdoor experience.

Tim agreed that recreational experiences in nature had influenced his relationship with nature. He related feelings of belonging to the natural environment to active participation in the outdoor experience:

"I think the experience influences a lot because it is when you participate actively, and you feel you belong to the natural environment. You feel surrendered to nature when you feel belonging there and as part of that environment. So, I think it's weird that there is not so much variation in your research scores because you have to integrate when you are in the natural environment. I think that the outdoor experience is super important in this relationship because it is when you are really interacting with the environment. Hence, it's impossible not to feel part of that if you're actively participating."

2.3 Listening to instincts/Letting the instincts take over to get in touch with the environment.

Elza highlighted that when she is in a natural environment, she feels life as a more intuitive process, and that helps her to feel nature better, which generates belonging:

“I think that sense of belonging increases if I let go of some ... mainly habits and even objects that I am very dependent on. Here in São Paulo, I am always ... I don’t know... It seems that I depend on a lot of equipment, cell phone, car, bus ... I think this dependence

generates an artificial life. But when you're in a natural environment, it's like you are by yourself, and that's fine. I think this is what I like, to feel something more intuitive. I think we are losing our instincts...In natural places, I get in touch with my instincts. Besides, there is a kind of exchange between the environment and me, and that is what generates belonging."

Theme 3: Aspects of the experience in the park that improve nature connectedness

According to the interviewees, the essential aspects to positively influence a connection with nature seemed to be related to the protected area's conservation status, the availability and maintenance of structures and services to support visitation, and the security aspect. Parnaso provided visitors the conditions to enjoy the experience, feel good and safe in the protected area. Those features impressed visitors a lot, maybe because being prepared for visitation is not the typical situation of a protected area in Brazil.

The following subthemes were identified:

3.1 Noticing the status of nature conservation in the park and of the structures to support visitation.

Francis asserted that the aspect he considered most important to stimulate improvement in connection was the general state of conservation of the park. He also noticed that the park is being very well maintained:

"I think the park's general state of conservation. Nature there is very well preserved. And I found the park very well maintained; the paths are well signposted, everything is clean, and the structure to support visitation is very good."

Robert affirmed that despite being used to Parnaso, he found the park more conserved than before, and that aspect made him feel happy:

"I am very used to visiting Parnaso. However, I saw some animals and some fungi I haven't seen before in that park. Those were the new aspects of that experience for me. Then I realized that Parnaso is more conserved than before. I noticed a difference in park preservation, and that made me happy. So, for me, the important aspect is to find nature well preserved. A place where I can take some fresh water from a river, feel the wind differently, where I can see wildlife."

Some interviewees mentioned that outdoor experiences in protected areas might have a more substantial effect on improving nature connectedness than outdoor recreation in other natural areas. In their perspective, protected areas are, in general, more preserved and well maintained, which provides a whole different experience. Rita also stated that experiences in protected areas stimulate learning:

"The park is much more preserved and maintained than a natural area located outside a park. For example, it is entirely different to be in Parnaso than to go to a place like Caledonia, where there is graffiti all over the place, besides being poorly maintained. It is not the same experience. The park is much more preserved. Besides, as I visit these areas, I learn something different. A plant, a bird that I have never seen before. So, each time I go, the connection improves a little bit."

3.2 Feeling safe in the park.

Lyla and Kathia reinforced the importance of feeling safe in the park to enjoy the experience:

"Ah, visiting parks helps maintain a connection with nature. I would say that I visit parks because I feel safer in those areas than in other natural areas. The security aspect counts a lot. I am lying alone here on the grass, which has to do with the fact that I feel like I'm not taking any chances. Safety is critical in parks, together with the staff who care about the area and keep the trails fully operating."

"Safety is also an important aspect for people to develop a connection with nature. If the person is concerned about their safety, they will not visit the park or any other area."

3.3 Learning with interpretive signage.

Some visitors described the trails and the interpretive signage along the trails as essential to help them pay attention to the park's environment, interact with it, and understand nature. Mary and Renato declared:

"The signs directed my view and my perspective for what was happening in that environment."

"Another thing that caught my attention was that the vegetation at the beginning of the trail had an identification, a small sign on some of them that taught us what they were. That

caught my attention. For a lot of people who go there, those trees are all bush. The signs gave us a notion of what was what in the forest. I fell in love with that."

Kathia pointed out that interaction with nature is essential to stimulate connection, and, in her perspective, this is done by providing informative and interpretative signage installed on the trails. She thinks that the information on the signs helps visitors understand the environment and connect to nature:

"It is easier for people to connect with the environment if they interact with it. For example, at the zoo, people interact with animals; for a person who is not used to it, the interaction is cool. For most people, the animal draws more attention. It's easy to see that. But the green, the bush is not so attractive, it's not so attractive because people don't interact with it. It is necessary to provide some extra information for the person to better appreciate that environment. Information stimulates people to understand a plant's characteristics and if it serves as a shelter for some animal, or a curiosity about a tree and a leaf. I think that this information makes the person more interested and connected to the environment."

Visitors' access to information was considered an aspect that should be improved by the park by installing more signs and providing a communication program throughout the year and not only in the high season. The communication program should count on the park's staff to assist, talk, and teach visitors about the park. Sandra and Nelson pointed out:

"I think there is a lack of access to information. During most of the year, the park does not develop, for example, programs focused on teaching about the park's fauna and flora. There is no available explanation about the park's environment... The visitor may be unaware of all those things. If the park had a communication program, it would encourage visitors to learn about the park. But of course, it had to be developed in an interesting way that would attract people, that would combine leisure with learning."

"I believe it would be important to spread signs with some messages... Some messages help people interact and be closer to nature. It would also be important to have staff in the field to assist, guide, and talk with visitors. I think it would be quite valid. Also, the messages on the signs could tell the person to pay attention to specific aspects, for example, wildlife in the park."

Some participants were bothered about seeing visitors feeding coatis. They think the park should prevent that by explaining to the public that it is not the right thing to do, and that could be done by installing some signs explaining the issue. Sandra argued:

"...visitors were feeding groups of coatis. I think the park should provide a communication program so that people understand they cannot feed coatis. It may be a lack of resources, right?"

Robert noticed some garbage on the park's roads, which bothered him a lot. He thinks that a program to sensitize visitors about the importance of conserving tourist areas would work:

"The last time I went to the park, I found some garbage on the park's roads. I noticed that young people were throwing garbage on the floor. I think this issue is a consequence of a lack of education. That bothers me a lot. I feel part of nature, so it bothers me a lot to see garbage on the floor. Parnaso could develop a program to sensitize people about the conservation of tourist areas, educating visitors."

3.4 Feeling good enjoying solitude and peace, surrounded by vegetation.

Vera asserted she felt more connected when she was on a trail surrounded by vegetation, and all she could see was the forest:

"Look, as I told you, the trails were the aspect that caught my attention. Hiking on the trails. Oh yes. In those moments when I didn't see any urban areas. For example, from the lookout point, at one of the stops, you have a wonderful view of Teresópolis, which was what I liked the most. But I felt more connected with nature in the moments when I was surrounded by vegetation."

Samantha affirmed that *"Nature has something, a kind of solitude that interests me."*

A sense of peace and wellbeing in the park, stimulated by solitude and preserved nature, is also an aspect that visitors highlighted as important to connect them to nature or start feeling the positive effects of being in nature. The wellbeing aspect is implied in many answers and directly stated in others. As examples, Mike and Thais said:

"The peace I feel ... being in such an environment conveys peace and tranquility to me. It is like cleaning the soul and the thoughts in my head."

"I would say that the visit to the park contributed to my wellbeing. I saw life in everything. Nature is life."

Samantha acknowledged that the park is wild and not so full of people on the trails, which let her better interact with nature:

“The fact that the park is still very wild. I met very few people on the way when I was hiking the trail. There were many people in the shelter and the camping site but only a few people on the trail. In this way, that context gave me greater opportunities to feel, to interact with nature more playfully.”

Tom admitted that moments of solitude in the park would work to strengthen connection:

" Perhaps a deeper connection would happen if we were alone there, or with fewer people."

Theme 4 - Aspects of the outdoor experience that enhance nature belongingness

Interviewees related feelings of belonging to psychological wellbeing they feel when being in nature, as highlighted below:

4.1 Feelings of freedom, comfort, and harmony in the natural environment.

Many interviewees highlighted a sense of feeling psychologically well during their visit and after leaving the park. They described that good feeling as the freedom to be, tranquility, peace, comfort, and harmony in that environment. In their perspective, all those feelings stimulated belongingness. Lyla argued that freedom is the most important feeling when she is in nature:

"Freedom is something that makes me feel good in the natural environment. But not only my freedom; the freedom of wildlife."

Rita reported that the park's landscape comforted her:

"The landscape ... if you hike the trails, you see that most of them face the Finger of God. Going up and seeing that landscape that most people don't see is very rewarding for me. I think it's my soul that feels comforted. And my body too. It's a little bit of both."

Tom explained his sense of wellbeing in nature, which is stimulated by a disconnection from day-to-day busy life:

"I think I have a sense of wellbeing when I am in an area like Parnaso, stimulated by a disconnection from day-to-day busy life. When you are in the natural environment, you have that feeling of tranquility, of harmony. And then we stop to think that being in the natural environment is what is natural. We believe that our natural environment is our day-

to-day environment, but no. On the opposite, we are a little away from home. When I am in nature, I feel better; there is a good feeling."

Belonging seems to be necessary for stimulating a connection with nature. Feeling comfortable in the natural environment helped visitors pay attention to nature and its details. It appears that a sense of belonging makes room for increasing connection. Tim reported feeling immersed in nature when he was in the park, which made him feel part of the natural environment and as so, want to preserve it in the best way possible so that other generations can also experience it:

"When I am in a natural environment, my interaction with it is so intense that I pay attention not only to the landscape, but I follow everything along the way. When you feel part of that environment, you want to preserve it to last for a long time so that other generations can take advantage of that space. If you see some garbage on the way, you want to take it out because you want to make fair use of that place if you feel you belong to that. That is why I believe your research's evaluation is really out of reality because of what I see and what I know of being in nature... So, my way of considering that I belong is really like that, I interact, I make fair use of the place, and I preserve it in the best possible way."

Paul affirmed he feels very comfortable in the natural environment and that that feeling influences his wellbeing when he gets home:

"When I'm in that kind of environment, it's kind of therapy for me. I totally escape the routine, the noise, the stress of everyday life. I feel very comfortable. The visit works like a purge; it cleanses my body. I come back home more inspired, lighter, much cleaner. How am I going to explain? Much purer."

4.2 Feeling part of the park and acknowledging its importance.

Ryan declared his love for the park and affirmed it is important for the city where he lives, for which he reported feelings of belonging:

"Well, I really like the park. Also, the park is important for my city. I like my city, so everything contributing to tourism or everything contributing to making the city stand out is good. It makes me feel good. It's like someone praising someone in your family. It's like you're praising yourself. If you're praising the park, you're praising the city. And if you are praising the city, you are also praising me because I am part of that city."

4.3 Feeling welcomed by the park's staff.

Another aspect that helped visitors feel belonging was the welcoming reception reinforced by the park's friendly and polite staff. Kathia explained:

"Conservation and welcoming staff were the two most important aspects."

John stated that, in his opinion, everyone who visits the park feels welcome:

"Everyone who goes to the park feels welcome. I talked with the park's staff, and everyone was very polite."

4.4 Feeling able to do, achieving a goal, overcoming a challenge.

Some respondents emphasized feelings that empowered them and made them feel good in the natural environment, stimulating belongingness. They argued that being able to do, achieving a goal, and overcoming a challenge were some of those feelings. The park offers many recreational possibilities in a friendly environment, stimulating many visitors to do activities they are usually not used to doing. Francis said:

"It is not easy to describe. I confess I am a very inactive person, but hey, I hiked three different trails that day when I entered the park. In places like Parnaso, I am willing to walk, reach a goal, reach the end of the trail because the environment makes me feel well and capable of doing that activity."

4.5 Enjoying solitude and deep immersion.

Tom admitted that moments of solitude in the park and deep immersion in that environment would work to improve belonging:

"I think that if the trail I hiked was in a more isolated area... there are always a lot of people on the trail. If it was possible to have a deeper immersion in that environment, I believe the feeling of belonging might improve. "

4.6 Reaching other audiences to stimulate nature belongingness.

Peter explained the park should stimulate families, especially those who live in the surroundings, to visit it by making it clear they are welcome. One way to do that would be by

improving picnic spots and planning special events for that public. He said that there was a pleasant family atmosphere in the park, which was lost over the years.

"I think they could stimulate families to go to the park. When I was a kid, we went to the park as a family, had a picnic, etc. When I grew up, I heard complaints from my elders, my parents. They said that there was a family atmosphere in the park in the past, which was lost over time... The park should make it clear that families are welcome. I know there are trails available, I know there are several things already, but there could be special events or something like this, to welcome families, especially those who live in the surroundings."

Paul acknowledged that entrance fees are expensive to most people, including himself, and that there should be a way of overturning that issue:

"...maybe cheaper tickets to enter the park.... I personally found it expensive. But on the other hand, maintaining a park with that structure, paying the employees, keeping everything clean, all of these things cost money. So, I think the government should pay more attention to that because indeed the park could have a lower value or free ticket for those who cannot afford it."

Ryan also expressed his opinion on the access of poor communities to the park, explaining that *everybody* needs access to natural areas:

"Nature is something people need. Access to those areas should be made possible for poor people through programs to encourage visitation as Parnaso does when it charges a lower ticket from local visitors. The poorest people do not have access to parks the way they should have. Often there is no interest on their part because they do not know this reality. The park's staff should provide that interaction and be a little closer to the communities."

Some more interviewees mentioned that the park should stimulate and extend access to other populations, such as communities that are not aware of the protected area or cannot pay for the park's entrance fee, besides students and the elderly. Rita justified her answer by saying that *"When you visit, you start building a bond with nature, or at least to respect nature."*

She also contended:

"They could also take more students to visit the park, encourage them to take walks. Because most people don't know a park, they have never been there, as I had never been there before... If the person doesn't like being in the bush, at least he will respect nature. It is a type of education. Doing environmental education in schools combined with visitation would be very important."

Theme 5: Influence of the experience in the park in general pro-environmental behavior

A little over half of the interviewees (15 people out of 25) agreed that recreational experiences in areas like Parnaso have positively influenced their behavior concerning the environment (the natural environment and the environment they live in). However, the rest of the group reported that outdoor experiences do not influence their behaviors to those more environmentally responsible.

The following subthemes were grounded in the answers of those who believe that there is a positive influence of the experience in environmental behaviors:

5.1 Improving awareness concerning the human impact on the environment.

Peter stated that outdoor recreation helped him improve awareness of the impact some behaviors have on the environment and stimulated him to be more environmentally responsible:

"Leisure experiences in nature helped me to realize how much we pollute. Today, I have more sense of responsibility concerning garbage, which I didn't have before. I am now concerned about the amount of waste we produce. I think that our country lacks social awareness, and we are not mature on those issues."

Vera argued that areas like Parnaso work as strong examples for visitors when conserved and *presenting* clean environments. According to her, a park's healthy environment encourages visitation and raises environmental awareness:

"Oh, yes, yes, for sure. People may change habits of throwing garbage on the floor as they experience preserved, clean, well-maintained environments. Brazil should invest in keeping Parnaso and other parks in full operation. That would encourage people to have more contact with nature and, consequently, environmental awareness. In short, I could see that Parnaso is well conserved and clean. I believe this is important and encourages visitors to be more aware, especially those who do not act that way in their daily lives. I think good examples can influence people's behavior."

5.2 A new perspective on conservation – less pollution, less consumption.

Samantha reported having a new perspective on conservation as a result of visiting protected areas. Those visits have helped her feel responsible for the environment and try to generate less waste:

"I think that outdoor experiences in natural areas like Parnaso gave me a new perspective on conservation. Currently, I believe we have not many preserved areas, and we need more of them. Besides, I feel like engaging in the sense of having environmental responsibility and trying to pollute less, generating less waste. We need to do something about this waste issue."

Mary agreed that outdoor recreation in protected areas help reinforce environmental awareness and especially the importance of conservation in people's lives. She reported she has changed behaviors to those more responsible concerning the environment; less pollution, less consumption of water, and trash separation for recycling are among the influenced behaviors:

"Yes, it reinforces, right? Especially the ideas of how important conservation is in our lives, water consumption, water waste, and recycling. We also have another perception of the law that prohibits plastic straws, and we abide by that."

5.3 Environmental learning from other visitors.

Thais highlighted she has started learning from other visitors, which has changed her thinking about the environment. She affirmed she had changed several behaviors, such as bringing home natural souvenirs from the park:

"Yes, I have changed several habits. Things that I used to do and didn't know it was wrong. I think the issue is our education system. So, I have started to learn from visitors in the park and the park's rules. I have started to develop another way of thinking. For example, I had a habit of bringing home small things from nature, such as a little plant, an orchid. I learned not to do that and respect nature."

Elza explained that, on these trips to protected areas, she has met people and *learning* from them about responsible behaviors regarding the place of visit and her place of living. She affirmed she has learned to value and take care of the environment she is living in:

"Yes, I think the experiences in nature influences environmental behavior. A nice thing that happens on these trips is that you end up meeting people who generally tend to be more

careful with the environment. I exchanged information about natural products and things you can do to pollute the environment less. In general, I save water, these things I already do. On trips like that one in Parnaso, we realize that there is a land that we are living in and have to value it, you know? We are so welcome, and we keep throwing things on the floor. So, in that sense, I believe that the influence of these experiences in nature is that you start taking care of the environment you live in."

5.4 Learning from observation and making comparisons.

Tom reported having a volunteer experience in a marine national park on cleaning some beaches. That experience helped him realize how much we pollute since he observed that the tide's trash was 70% plastic. Such an experience has stimulated his intentions of changing behavior concerning the amount of garbage he produces at home:

"Certainly, the visit helps... Contact with nature makes us want to improve the conservation of the environment. I had an experience of cleaning the beach in the Lençóis Maranhenses National Park, as I told you before, and because of that we are thinking about reducing our trash, like stop using plastic, straws, etc. I had read a lot about it before going to Lençóis Maranhenses, but in the park, we saw that the tide's trash on the beach is very serious; 70% of waste is plastic, a dire situation."

Paul stated that outdoor experiences in parks influence his daily life since they make him want to transform his environment into a healthier one:

"Yes. We start making some comparisons concerning the environment. Like, that place could be like this way, the other place could be like that... It makes us see a piece of land and want to grow something. We start comparing and trying to work to get closer to a healthy environment."

Lourdes acknowledged that she has been learning from her experiences in protected areas to be more mindful of the environment and consume less:

"The visit to such areas like Parnaso positively influences a lot... I think that the more we see that things can be more natural, that we carry as little as possible in our backpack, we start making comparisons with our own lives. Every time I pack the gear, and every time I have to buy something, I think, do I really need it?"

5.5 No influence on behavior.

Ten out of 25 interviewees do not think that outdoor experiences can influence environmental awareness and behaviors. For example, Dorothy argued that visits to parks might help visitors reflect on the environment but do not have the power to change behaviors or encourage new ones. In her perspective, when in the park, visitors only focus on the beauty of the place, enjoying it, and having fun. She also argued that there are ways to communicate with people about responsible behaviors, which might have a more effective influence on their behavior, such as social media and daily news:

"No, visits to parks can even make people reflect a little, but not in a way that will make them recycle garbage, for example. Other things in people's lives may stimulate behavior changes. The park could even address these issues; I don't know exactly how. But in the park, we are very focused on the beauty of the place, enjoying it, having fun. If the person does not mind about the world, one visit to the park will not encourage new behaviors. We are always watching the news and social networks to understand how our lifestyle habits affect the environment. Because of all this information we receive every day, it is impossible to continue being so consumerist. We need to consume the world less and avoid wasting natural resources on things that are not necessary."

Sandra argued that a visit to a park might keep people in touch with nature, but changing behaviors as a consequence of the experience must not be the case:

"No. "I believe that when you visit a park, you keep in touch with nature. But changing attitude due to the experience in the park is not the case"

Nelson mentioned that recreational experiences in protected areas do not have the power of influencing daily care for the environment unless the visitor is already a person who cares about it. In this case, the visit would be "super valid" to strengthen visitors' desire to fight for conservation, instead of letting all the responsibility on the State shoulders:

"I do not know if visiting a conservation unit can influence the care for the environment. I guess it is more of a matter of environmental awareness. I think that visits to natural areas would not be enough to influence daily care for the environment, in addition to a greater responsibility to care, to care for what others do not care. On the other hand, if there is a previous awareness process in a visitor's mind, the visit is super valid because this way people would have more strength to fight for conservation, even if on a small scale, instead

of delegating all the responsibility to the State, the government. The important thing is to take action."

Kathia recognized that visits to a stunning area like Parnaso might influence visitors' minds about conservation and the use of natural resources. But she also affirmed that the experience in the park might not directly impact visitors' daily life.

"I do not think so. I think that the experience does not strongly change people's willingness to act with environmental awareness daily. In my case, I don't know; I already have this awareness, regardless of visiting a park. I have a different view. But on the other hand, if a person feels touched by being in a protected area...you know...touched by the stunning nature, he may have a greater incentive concerning conservation and the use of natural resources. I think the experience may influence behavior, but I don't know if it directly impacts people in their daily lives."

Other interviewees, like Ryan and Mike, do not see any direct relationship between visiting parks and having pro-environmental behaviors, but relate having those behaviors with family habits or education:

"I haven't noticed it yet. Some environmental behaviors we do, they have to do with family habits. The visit to the park makes me feel physically okay, but it does not cause significant changes in my day-to-day life."

"Honestly, no. I think that one thing has nothing to do with the other. I live in the city. When I go to parks, I disconnect and enjoy that moment. But if I see someone destroying nature, it makes me angry."

Theme 6: Influence of the park experience in support for protected areas

The vast majority of participants (22 out of 25) recognized that visiting protected areas influence positively their ideas about nature conservation, respect for nature, and support for parks. The following subthemes were identified:

6.1 Agreeing on the influence of the experience for stimulating park support, but not explaining the kind of support.

Peter, Renato, Kathia, and Tom are examples of interviewees who affirmed that visits to protected areas stimulate park support. However, they did not point out what they could do to

support those areas. Peter acknowledged that visiting parks helps reinforce the idea of nature conservation and might help bring more people to that side. He also affirmed he wants the park preserved so that his son can have the same opportunities and experiences he had:

"Yes, the visits help reinforce the idea of conserving these environments. Parnaso is very important due to several ecological factors, and we ignore it. I believe that the park will be preserved because it is a protected area. I want the park preserved because I want to take my son there to have the same opportunities and experiences. I matured and maturing generates reflection and such. I think it is essential to bring more people to the conservation side, to be more aware of the importance of conservation, because we depend a lot on society to succeed, right?"

Renato recognized that the experience inspires people to value and support protected areas. Besides, he affirmed that the opportunity to be in preserved nature helps visitors think broadly about nature and understand that we depend on nature to live. However, Renato is one more example of understanding the importance of protected areas without having any idea of how he could do his part to support those areas:

"I think that the experience inspires us to support these areas because we start valuing them. If we don't take care of them today, what will the new generation see tomorrow? And we depend on nature to live. Unfortunately, the new generation is not paying attention to this. But when we go to the park and observe everything, we start to think broadly about nature, its importance in our lives."

Kathia assured that the visit encourages support for natural areas and respect for nature, but she also could not explain what she could do support those areas:

"The visit encourages support for natural areas... I think the visit encourages people to have more respect for nature. I think that when you see the beautiful nature in the park, that encourages you to preserve it, to have it preserved."

Tom expressed that being connected to nature makes him pay more attention to the natural environment and eventually he wants to take action. However, he confessed that, although he had been a volunteer once at a national park, he was not used to taking concrete steps to support parks:

"Indeed, when a person is connected to nature, he starts noticing or paying more attention to what is happening in that environment. When I repeat the visit to a place and see that it is degrading, I think I should be more concerned and help take care of this specific place... However, I am not so used to taking concrete actions to support parks. Recently, I participated in a cleaning day at one of the beaches at Lençóis Maranhenses National Park. I should participate more in volunteer actions in protected areas and do more things in everyday life, like using less water and separating garbage for recycling. I mean, I should try to take care of the environment as a whole and not only parks."

6.2 Agreeing on the influence of the experience for stimulating the support for parks and offering an understanding of what that support would be.

Some of the interviewees who agreed that visits to protected areas can influence support for those areas specified the way they would do that support.

6.2.1 Volunteering.

Some participants expressed their intention to support parks by volunteering their time. Although this kind of support is not yet widespread in Brazil, the number of volunteers for protected areas has been increasing (slowly) in the last years, thanks to parks agencies and NGOs' efforts to implement volunteering programs. As an example, Tim affirmed he is already a volunteer at a Brazilian national park:

"Yes, of course. I am a volunteer at Tijuca National Park in Rio, and from time to time, I do some volunteer maintenance work on both the trails and monuments inside the park. I have not yet adopted any trail stretch due to lack of time, but when there are task forces to clean the trail, I usually take part."

Elza asserted that the present research worked as a kind of trigger and stimulated her to think about volunteering at a park:

"After I participated in your research in the park, I started to follow the Instituto Chico Mendes's website to find a possible way to help and be a volunteer."

6.2.2 Visiting more and paying higher fees.

Samantha expressed her intention to support parks by visiting more and paying higher entrance fees to contribute to the protected areas' maintenance and preservation. She has learned

that there is a cost to keep those areas preserved and currently thinks visitors pay a low price to enter protected areas in Brazil. She also affirmed that Brazilians do not value public services, so some Brazilians think it is not fair to pay to enter a public area such as a national park. She said:

"Yes. And one way of doing that would be visiting more and paying a higher entrance fee to contribute to the maintenance and preservation of that place... . In the past, I thought it was weird to pay a fee to enter parks; then I started to understand the reason for that because of the valuation of nature and because we need to protect it. Nowadays, I think the fee to enter the parks is very cheap. I think the question is how we value public service. People say, wow, if the parks are public, why should I have to pay to enter them? But everything has a cost, and nowadays I think visitors pay a low price to enter a protected area."

6.2.3 Encouraging friends to visit parks and keeping the parks clean.

Francis manifested his intention to support parks through encouraging friends to visit, and keeping the protected area clean and conserved:

"Picking up trash or encouraging friends to visit saying, hey, the place is so cool, let's keep it conserved."

6.3 No influence of the experience in stimulating support for parks

A small part of the interviewees (3) declared that recreational experiences in protected areas do not necessarily lead to support to those areas or even do not make any difference in intentions to give that support. Lourdes argued that even when the experience is positive, it might not lead to any support:

"The experience, even if positive, does not necessarily lead to support. For example, I do not do any work for these areas; I just go visiting them. I think that involvement depends on the window of opportunity as well. Of course, if I had a chance to help in any way, I would take the initiative."

Robert commented that the experience did not influence him concerning the intention to act in favor of protected areas:

"I don't think the experience has changed me in this way because I was not very involved with parks and the environment. Today, my head is in another setting. I am working in a city. The visit itself brought no change. It may still bring."

Nick affirmed he would support parks because that is his nature; however, in his perspective, visiting parks has not influenced him in that way:

"Yes, if I had the opportunity to support the parks, I would like to. But that has nothing to do with visiting parks. It is my nature because I always liked to do that."

John mentioned that, in his perspective, first-time visitors are the ones who would be more influenced by the experience in a protected area to give support for parks and spread the news about parks:

"Look, I think that, especially for those who go for the first time and for those who have never had much contact with parks, I think so, I think the person ends up giving more support and spreading the word about the park because he feels welcomed, and at peace. We want the environment ... we want to increase the number of areas of this type in our country, but to do it seems to be complicated."

Summary of the interview data analysis results

Most participants, including those who reported having a connection to nature before the trip to Parnaso, agreed that each recreational experience in natural areas improves or reaffirms their relationship with nature, mostly when the experience happens in a protected area. Therefore, for interviewees, being nature connected is a process and is not a result of a one-off event. From participants' perspectives, improvements in connection are stimulated by the protected area's conservation status, allowing participants to have more profound experiences in nature and a sense of wellbeing they can only feel in that kind of environment.

The availability of infrastructure and services to support visitation was considered essential to help visitors pay attention to the park's environment, interact with it, and learn from it, opening space to increasing belonging and connection. Analyzing participants' answers, it is possible to infer a kind of excitement and a positive feeling of surprise when they realized the park's level of organization concerning these two aspects - conservation status and good support for visitation. One respondent even said he was used to visiting parks abroad but did not know

that there were parks very well maintained and conserved in Brazil, as Parnaso. That suggests that participants felt amazed because the park was fulfilling its mission by protecting a natural heritage that belongs to everyone, allowing people to experience that conserved environment, and organizing the structures and staff to welcome visitors.

Some participants also mentioned the security aspect as important to help them feel comfortable while visiting a protected area, making them choose a protected area to visit instead of any other natural site.

Participants highlighted the positive impacts of nature in their lives as consequences of feelings of wellbeing in the natural environment. According to them, feeling good in the natural environment stimulates a better understanding of nature and a personal disposition to visit more times and invite friends to visit protected areas, advancing belonging and connectedness. Some argued that being nature connected is a function of the number of visits to natural sites or how used a person is to the natural environment. They pointed out that there are always improvements in connectedness due to a visit to a protected area, and a few argued that a positive impact might be stronger for first-time users.

A few participants affirmed that the visit to Parnaso did not make much difference or any difference in their connection. For them, feeling nature connected is a consequence of factors other than visitation such as family activities in natural environments, childhood in nature, a place of residence surrounded by nature, or having an occupation that makes them have a lot of contact with nature (like being a biologist). From one participant's perspective, those who are not comfortable in the natural environment or are being over-challenged by hiking a strenuous trail might have the strengthening of their connection hindered. Feeling comfortable (physically and

psychologically) in the natural environment seems essential to open space for increasing connection.

Some visitors affirmed that trails and interpretive signage along the trails are essential to help them pay attention to the park's environment, interact with it, and understand nature. Interaction with nature was considered vital to generate connectedness. Easy access to information and a communication program would also help bring people closer to nature and even prevent destructive behaviors, such as throwing garbage on the floor and feeding animals.

Concerning nature belongingness, respondents described it as a feeling relying on the familiar, a sense of nostalgia, nurtured by many visits and learning about nature. Positive psychological emotions such as freedom, tranquility, peace, comfort, and harmony in the natural environment made participants feel part of that environment, increasing their sense of belonging. Those good feelings resulted from deep immersion in nature, participating actively in the park experience, and disconnecting from everyday worries. Improvements in belongingness were also related to feeling welcomed, feeling able to do (a hike), achieving a goal (to get to a specific place in the park), or overcoming a challenge (hiking a strenuous trail). The park offers many recreational possibilities in a conserved and friendly environment, stimulating visitors to do activities they are not used to, generating a wellbeing state that lasts after the visit.

Some interviewees mentioned that other audiences should be stimulated to visit Parnaso and other protected areas. The access should be extended to surrounding communities that are sometimes unaware of the protected areas or cannot pay for a park's entrance fee. Participants asserted that the visit could stimulate a sense of belonging and respect for nature, which would work to build connectedness. Belonging seems to be necessary for making room and promoting increasing connection with nature.

Most interviewees agreed that recreational experiences in protected areas positively influence behaviors that affect the natural environment and the environment they live in. In their perspective, visitation helps improve awareness of the impact some behaviors have on the environment and build a new perspective on conservation; less pollution, less water consumption, litter prevention, and trash separation for recycling are among the influenced behaviors. Learning from other visitors has contributed to participants' new perspectives on how to pollute the environment less. Also, they have changed some bad behaviors, such as bringing home natural souvenirs from the park. One participant stated that he realized how much plastic pollutes the sea during a volunteer action in a marine national park; that perception stimulated him to reduce the garbage he produces at home. However, some participants reported that outdoor experiences do not influence environmental awareness and behaviors. For them, visits to parks might help visitors be aware of the environment but do not have the power to change behaviors to those more environmentally responsible or encourage new ones. In their perspective, those behaviors are more related to family habits or participants' education levels.

The vast majority of participants recognized that visiting protected areas influences visitors' beliefs about nature conservation positively, stimulating respect for nature and support for parks. According to participants, visiting parks reinforce the understanding that we depend on nature to live and might help bring more people to the conservation side. However, some respondents could not point out what they could do to support those areas and recognized they are not used to taking concrete actions in that way. Of the participants who specified how they would support parks, some mentioned that they would volunteer their time. Although this kind of support is not yet widespread in Brazil, the number of volunteers for Brazilian protected areas has increased in the last years, thanks to park agencies and NGOs' efforts to implement volunteering programs.

Other participants expressed their intention to support parks by visiting more, encouraging friends to visit, and paying higher entrance fees to contribute to the protected areas' maintenance and preservation.

A small number of interviewees declared that recreational experiences in protected areas do not necessarily stimulate support to those areas or even do not make any difference in intentions to give that support. One respondent argued that first-time visitors would be the ones who would be more influenced by the experience in a protected area to give support for parks and spread the news about parks.

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CHAPTER V

DISCUSSION, CONCLUSION, AND RECOMMENDATIONS

This dissertation's primary objective was to understand if a recreational experience in a protected area could improve visitors' relationship with nature, manifesting as visitors' intentions to behave pro-environmentally through general behaviors and specific behaviors in favor of protected areas. A relationship with nature was represented by nature connectedness and nature belongingness constructs. It was hypothesized that those two constructs, positively impacted by an outdoor experience in a protected area, would directly influence pro-environmental behavior intentions.

Many researchers have studied the nature connectedness construct to represent a person's relationship with nature, and many different measurement scales have been developed and used to understand that relationship. The nature belongingness construct has not had much attention from researchers and has been an under-acknowledged and under-utilized mechanism of outdoor recreation management (Brown, 2016). Therefore, the study of nature belongingness was one of the unique contributions of this research and was driven by the researcher's belief that park managers should better understand it to instill in visitors a sense of welcoming, feeling valued, feeling comfortable, and fitting in the natural environment. Those feelings would promote a visitors' sense of wellbeing that would endure after leaving the park. Many studies have concluded that nature connectedness can influence and drive visitors' relationship with nature and a self-commitment to its preservation (Hartig et. al., 2001; Mayer & Frantz, 2004; Dutcher et al., 2007; Hinds & Sparks, 2008; Hoot & Friedman, 2011; Zelenski & Nisbet, 2014; Rogers & Bragg, 2012; Tam, 2013; Lin et al., 2014; Zylstra et al., 2014). This study's author wanted to understand the power of nature belongingness in transforming or stimulating that relationship.

The relationships among nature connectedness, nature belongingness, and pro-environment behavioral intentions, and the understanding of their variation due to a recreational experience in a protected area are also significant contributions of the present study.

This research was developed in Parnaso, a Brazilian national park situated in Rio de Janeiro, and the data was collected in the summer of 2018, using a mixed-methods approach. The use of that approach was necessary to answer the research questions, composed of quantitative and qualitative questions, and to better understand the complex phenomena of an outdoor experience. Thus, the use of mixed methods had the intention of dealing with some of the limitations of both the quantitative and qualitative approaches by using the strengths of each one to complement the other (Teddlie & Tashakkori, 2003; Byrne & Humble, 2007; Fetters et al., 2013; Oliveira, 2020).

Besides the research questions, qualitative and quantitative approaches were mixed in other stages of the present study, including data collection, analysis, and data interpretation. A multistage approach (Creswell et al., 2003; Fetters et al., 2013) was conducted during data collection. In the first stage, using a convergent design, the qualitative and quantitative data were collected and analyzed during a similar timeframe. Surveys (pretest-posttests) were conducted with a large group of individuals, and a sub-sample of those individuals answered ESM questionnaires to help explain or elaborate on the quantitative results.

At this point, the ESM data showed that, during their experiences, participants were aware of feelings and aspects of the visit that would enhance connectedness and belongingness. ESM results made the researcher believe it would be worth it to perform the second phase of qualitative data collection to explain seemingly contradictory results that emerged from using different methods in the first stage. The second phase aimed to better understand participants'

perspectives on connectedness, belongingness, PEBI, and the relationship between their park experience and those constructs. An explanatory sequential design was performed (Creswell et al., 2003; Ivankova et al., 2006; Feters et al., 2013), and the findings of the first stage informed the second stage qualitative data collection through in-depth interviews (follow-up interviews) applied to a sub-sample of the large group of individuals. The follow-up interviews helped clarify the influence of the park experience on NC, NB, and PEBI and how participants understand NC and NB. Next, the integration of qualitative and quantitative data at the interpretation and reporting level occurred through a narrative approach (Feters et al., 2013).

This chapter was formatted around this study's contributions to the applied field of conservation social science and especially to the Brazilian toolkit of visitor use management. Then, the limitations of the study design and management recommendations were also presented, followed by suggestions for future research.

CONTRIBUTIONS OF THIS STUDY

The application of a reliable and valid nature connectedness scale to a context of domestic visitors in a Brazilian national park

To date, several assessment tools have been developed to measure connectedness with nature (Tam, 2013; Zylstra et al., 2014; Restall & Conrad, 2015). Some measures are unidimensional, others multidimensional, some are deemed to measure the affective aspects of a connection to nature (Emotional Affinity Toward Nature by Kals et al., 1999; Connectedness to Nature by Mayer & Frantz, 2004; Love and Care for Nature by Perkins, 2010), while others measure essentially cognitive aspects (Inclusion of Nature in the Self by Schultz 2000).

As mentioned in the literature review, many authors (Chawla, 1998; Kals et al., 1999; Schultz, 2001; Schultz, 2002; Opatow & Clayton, 2003; Mayer & Frantz, 2004; Dutcher et al.,

2005; Nisbet et al., 2009; Perkins, 2010; Brugger et al., 2011; Cheng & Monroe, 2012; Tam, 2013; Zylstra et al., 2014) have defined NC as comprising one or more of the following dimensions: cognitive, affective, and experiential. The present study contends that it is essential to discuss the dimensionality of NC, mainly because there is no consensus about it. For example, the NC scale by Mayer and Frantz (2004) that was designed to measure the emotional aspect of being connected to nature, was questioned in a study by Perrin & Benassi (2009) that affirmed that the scale measures cognitive beliefs. Another scale by Dutcher et al. (2007) described connectedness as a perception of sameness between the self and the natural world. However, they did not explicitly specify whether that subjective experience refers to a cognitive appraisal, a sense of affective affiliation, or other aspects (Tam, 2013). Another example is the 21-item scale by Nisbet et al. (2009) that intends to be a comprehensive measure of connectedness because, according to its authors, it comprises the three dimensions mentioned above (cognitive, affective/emotional, and experiential). However, the short version of the 21-item scale, developed by Nisbet and Zelenski (2013) and used in the present study, comprises six items that emphasize the cognitive and experiential dimensions, lacking the emphasis on the affective dimension.

The present study subscribes to Tam's (2013) and Restall and Conrad's (2015) perspectives based on their studies comparing different concepts and measures of connectedness; they recommended conceptualizing and exploring that construct as a multidimensional framework since this approach consistently stands out as showing better results.

The use of the short Nisbet and Zelenski's scale answered its authors' call for future research that could test and determine its efficacy in different social and cultural contexts other than Canada when it was first tested. Besides, that scale was used because it has a similar

external correlation pattern as the full 21-item scale and helps research contexts where time and financial resources are limited, which was the present study's case. Unlike the longer scale, the short form intended to reduce redundancy and participant fatigue, especially considering that respondents were asked to answer to three different scales (NC, NB, and PEBI) in the research. When applied to the Brazilian context, the scale demonstrated good internal consistency; it correlated with PEBI and was positively related to the frequency people recreate in contact with nature, showing consistency with Nisbet and Zelenski's results. However, the NC scale failed to show variability among participants (79,5% of participants scored over 4 in NC before entering the park, and from those, 26% scored 5). Also, when comparing the pre and post-visit applications, the scale did not capture the effect of the experience in Parnaso on visitor's relationship with nature (find this item detailed below). In the perspective of this study's researcher, that happened much because the scale failed to access the emotional dimension related to that construct. When a dimension is missing or is not emphasized on an NC scale, it can weaken that measure depending on the context being studied and the measured population. Understanding the vital dimensions of NC can avoid its measurement tool do not capture individual differences on that construct.

As already highlighted by Zylstra et al. (2014), the way people experience and connect with nature is influenced by demographics, geographies, culture, and language. Brazilian cultural values are centered around affect, emotion, and living in the present moment. Indeed, the claims are that Brazilians are emotional and outgoing (Poelzl, 2009; Branco & Williams, 2006) and have higher expression levels across all emotions and situations (Carew et al., 2004). Those cultural aspects, together with the place and context where respondents were approached (they were recreating in the park when invited to participate in the study), may have influenced

participants' responses. Therefore, item revision and eventually item addition are needed so that the multidimensionality of the short Nisbet and Zelensky's scale can be warranted, including and highlighting the emotional dimension.

Indeed, when Nisbet et al. (2009) first developed their full 21-item scale, they had already assured that one needs to investigate the role of emotions and experiences and how these factors interact to explain individual differences in connectedness. Researchers are increasingly taking emotion and affect seriously in explaining a connection with nature since not everything can be explained by models of cognitive, rational, or planned behavior (Gorman, 2005; Zylstra et al., 2014; Zelenski & Nisbet, 2014; Restall & Conrad, 2015; Brown, 2016).

This study's qualitative data suggest that people seem more mobilized by affection than by cognitive aspects in Brazil, which was also noted in the field when surveying participants and testifying their emotional reactions when answering the posttest after their experience in the park. Still, participants recognized that the cognitive and experiential dimensions are also fundamental for stimulating connectedness.

The development and validation of a nature belongingness scale

The study of nature belongingness was guided by the researcher's desire to better comprehend visitors' feelings of fitting in, being at home, being comfortable, and feeling a sense of wellbeing in the natural environment due to spending time in nature. A sense of belonging is essentially a psychological construct, a personal feeling or perception that refers to a reciprocal relationship to some entity outside oneself (Zaradic & Pergams, 2013; Lambert et al., 2013; Mahar et al., 2013). In this study, NB was analyzed by considering the natural environment as the external referent that grounds the individuals' subjective perceptions of belonging. "This

dynamic phenomenon may be either hindered or promoted by complex interactions between environmental and personal factors." (Mahar et al., 2013, p. 1026).

Several instruments have been developed to assess belonging, especially in the realm of social relationships and health sciences, but still, there is no consensus about the measure (Mahar et al., 2014; Allen et al., 2021). To better understand NB, the individual differences on that measure, and the effects of a recreational experience in a protected area on that construct, this study proposed a 6-item scale to operationalize NB. The measure was drawn from a comprehensive belongingness theory review and grounded on past studies from the psychological and social sciences, like Jones et al. (2000) and Mahar et al.'s (2013). The scale reflected the main attributes of belongingness: feeling welcome, integral, valued, in harmony, and fitting in an environment. In addition, one item encompassing the manifestation of emotions was added to the scale since the emotional aspect is considered fundamental to compose and stimulate a sense of belonging.

Although many studies have argued that belonging is a universal human need (Baumeister & Leary, 1995; Fiske, 2004; Myers, 2000), how belonging is expressed and communicated is culturally contextual. That is why the researcher, a native Portuguese speaker, first drafted the scale in Portuguese, pretested it in Parnaso, applied it to Parnaso's visitors, and then translated it into English to compose the present document. The language and cultural aspects made it difficult to translate the belongingness scale into English, especially the item exploring emotions.

The findings supported the reliability and validity of the proposed measurement scale, which exhibited high internal consistency and correlated with PEBI. The scale showed concurrent validity because some visit characteristics that were conceptually linked to belonging

were related to belonging measures (for example, time spent outdoors, in nature). Those results are consistent with the study by Jones et al. (2000) and Kunchambo et al. (2017) on belongingness.

Even though the reliability and validity of the proposed scale had been verified, the scale has poorly accessed individual differences on NB, considering that 58% of participants scored more than 4.8 (among them, 34% scored 5, the highest level of belongingness). To explain what might have influenced those results, one can argue that the proposed scale (as most applied belonging measures) assessed belonging from a more state-based sense of belonging, capturing transitory feelings of belonging. Those transitory feelings might have been influenced by participants being approached in the park (the context has positively impacted the answers). Walton and Cohen (2007) argued that nature experiences would converge for a more stable, trait-like sense of belonging to emerge. In this sense, this study's proposed NB scale would be improved by adding more items assessing a trait-like sense of belonging, which defines a more stable and lasting aspect that could better differentiate individuals.

A better understanding of the relationship between nature connectedness and nature belongingness

The present study contends that belongingness and connectedness are primarily individual experiential processes (internal processes) that park managers can stimulate. That is why both constructs need to be distinguished by those planning and managing recreation in protected areas. Considering both constructs in visitation management would enable a more nuanced understanding of the human-nature relationship, helping managers work to strengthen it (Crisp, 2010). However, the link between experiences and the development of belongingness and

connectedness is probabilistic, not deterministic. All managers can do is create the opportunity for the experience to happen (McCool, 2006).

In this research, connectedness and belongingness were explored as feelings that lack specificity concerning the relationship's object, differing from other constructs like place attachment. That means that people connected with nature or feeling a sense of belonging to nature do not link their appreciation to a specific natural place. Instead, they refer to the feeling of being connected to broad nature and belonging to types of landscapes or natural environments (Jones et al., 2000; Colléony et al., 2017).

Two measurement tools were used to advance understanding of both constructs; they were first tested individually and then placed on a structural model. When tested separately, the Nisbet and Zelensky's short scale and the nature belongingness scale developed in this study provided reliability and validity. However, a very high correlation (more than .95) between those constructs was presented, implying insufficient discriminant validity when conducting a paired construct test.

Discriminant validity is the extent to which a latent variable discriminates from other latent variables. Therefore, both nature connectedness and nature belongingness should account for more variance in the observed variables associated with them than with other constructs within the conceptual model (Farrell & Rudd, 2009). In the present study, there was a lack of discriminant validity between NC and NB. Considering that the NC measurement scale was confirmed as reliable and valid in this study and its developers' studies (Nisbet and Zelenski, 2013), the validity of the NB individual indicators is questionable, and inferences concerning relationships between the two constructs cannot be provided (Fornell and Larcker, 1981).

The lack of discriminant validity between the two constructs had implications for this study's hypothesized overall model (Figure 2), which put together NB and NC to test their relationship with PEBI since the conceptual model could not be tested. To improve the understanding of NC and NB and better differentiate them, the qualitative data were analyzed to shed light on participants' perspectives on those constructs. Qualitative data can form the context for quantitative research since they help give insight to better understand both constructs and improve their measures tools.

A better understanding of the construct nature connectedness

To better understand NC and better differentiate it from NB, the empirical perceptions of connectedness expressed by this study's participants and presented in the qualitative data were assessed. The follow-up interviews helped the researcher understand that respondents were able to differentiate NC from NB and link those constructs to aspects related to them in the literature review. The follow-up interviews also helped the researcher recognize NC and NB aspects in the ESM data.

Participants related NC with three dimensions - the cognitive, the experiential, and especially the emotional dimension - reinforcing the theory about the importance of the multidimensionality of a tool to measure NC.

First and foremost, participants affirmed being amazed by the park's stunning nature, the imposing mountains, the incredible landscapes, and beautiful scenes like sunsets and sunrises; they associated that feeling to the greatness and value of nature, affirming they got emotional before its force and beauty. Feeling that way made them want to respect and admire nature even more. Indeed, if in Brazil connectedness is mainly related to emotional and affective elements, then it is essential to use a scale that prioritizes that dimension.

Feeling comfortable in the natural environment helped participants pay attention and value nature's details; the wind, the colors, the vegetation, the trees, the flowers, the smell, and the wildlife amazed them and awakened affective feelings. The silence and peace they felt in the park's environment made them feel re-energized and relaxed.

Learning about nature was another aspect highlighted and linked to the connectedness construct, reinforcing the cognition dimension. According to respondents, visits to protected areas stimulate environmental learning through interpretive signage and programs, and especially from learning nature's values intuitively, based on their own experience. Also, learning from other visitors' behaviors and beliefs has contributed to participants' new perspectives on conservation.

The perception of the protected area's conservation status was emphasized as essential to connect participants to nature; well-conserved areas would stimulate connectedness, fueled by a sense of peace and wellbeing produced by meaningful experiences of immersion in nature. Linked to that, respondents valorized the perception that the protected area was fulfilling its mission by preserving a natural heritage that belongs to everybody and called attention to the park's role in protecting water sources, ensuring clean water for society.

Interactions with nature were considered vital to generate connectedness. Participants affirmed that each visit works to reaffirm and stimulate a stronger connection with nature. Indeed, analyzing the quantitative data to assess participants' characteristics that could influence NC, results indicated that those who used to spend time in contact with nature scored significantly higher than those who did not. Concerning the number of visits to protected areas in the last two years, the analysis showed significantly higher NC mean scores for all options (one visit, two visits, or three or more visits) than those who did not visit a protected area in that

period. Those results are consistent with earlier studies (for example, Zylstra et al., 2014), which reported that the effects of experiencing nature are part of the process of building nature connectedness.

Participant's age and gender were also characteristics that influenced NC results. The comparison tests indicated that NC mean scores were significantly higher for older groups, from 50 to 69 years old, than those younger, from 18 to 29. Those results suggested that connectedness and its effects grow over time due to continued visitation. Besides, older people seemed more susceptible to positive nature's impacts, probably because they had more outdoor opportunities during life (85.7% of that group visited protected areas three or more times in the last two years).

Females' NC mean scores were significantly higher than for males. However, the influence of gender on connectedness is not a consensus. For example, this research's results endorse the study by Tauber (2012) concerning higher connectedness ratings for women compared with men; the author explained gender differences in connectedness, suggesting that women are more empathetic and might better respect nature. However, the studies by Mayer and Frantz (2004), Dutcher et al., 2005, and Di Fabio and Rosen (2019) differ from the present study's results on gender, affirming that men did not differ significantly from women on nature connectedness. It seems that different scales produce different results depending on the dimensions used to access that construct.

A better understanding of the construct nature belongingness

Nature belongingness is essentially a psychological construct grounded by affective/emotional connections (Kunchambo et al., 2017). It represents a fundamental human

need that predicts numerous mental, physical, social, and behavioral outcomes (Allen et al., 2021).

The perspectives of the present study's participants can help achieve a better understanding on belongingness. They revealed a sense of familiarity and feeling at home in the park, reinforced by an atmosphere of friendliness, closeness, and freedom to be and act. In addition, some aspects of the experience in the park were highlighted and described as those that worked to strengthen their sense of belonging: feeling immersed in nature, which improved the feeling of being part of the natural environment and made participants disconnect from everyday worries; feeling welcome in the protected area, which was reinforced by a friendly staff and by realizing that the park is well managed for visitors; participating actively in the outdoor experience, due to interactions with the environment (guided by personal and intuitive processes, or by interpretive signage or personal guidance); feeling the park as a friendly environment, which empowered participants and made them feel capable of performing the activities available; achieving a goal or overcoming a challenge (by reaching a specific site or hiking a strenuous trail); and feeling important because of the park, which locals reported. All those aspects made participants feel psychologically well during the visit and after leaving the park due to an emotional state or reaction; the feelings reported were tranquility, peace, calmness, comfort, harmony in the natural environment, love for life, joy, and happiness.

The qualitative analysis brought insights to attend a call from Jones et al. (2000), Mahar et al. (2013), and Allen et al. (2021) about the need to build a more precise conceptualization of NB. In addition, a more accurate conceptualization will help park managers evaluate the effectiveness of strategies to stimulate that psychological construct through visitation. Adapting Jones et al.'s and Mahar et al.'s belongingness definitions by including participants' perspectives

on that construct, *NB concerns the subjective feeling of wellbeing derived from a relationship to nature that promotes feelings of freedom, tranquility, peace, comfort, harmony in the natural environment, and a sense of being at home and being part of nature, built on a foundation of significant experiences on the natural environment. The sense of wellbeing endures during and after the experience in nature, resulting in affective bonds that can stimulate and strengthen a connection with nature.* As Mayer and Frantz (2004) have already stated, feeling a sense of community, embeddedness, and belongingness to nature are all aspects of a broader sense of connectedness. Therefore, belonging seems necessary for stimulating connectedness and makes room for strengthening it.

The belonging characteristics and related psychological feelings drawn from this study's qualitative data and described above can be used to improve the NB scale proposed by the present study by rewriting some items and adding others. Thus, there is a call for future research to revise the scale items and operationalize NB, analyzing its impact on NC and PEBI since that construct is relevant to stimulating a stronger connection with nature.

Participants' and visits' characteristics that influenced NB were gender (NB mean scores were significantly higher for females) and the frequency of visits to protected areas (those used to visit protected areas scored significantly higher than those not used to). The oldest group (50 to 69 years old) showed significantly higher scores compared with the youngest (18 to 29).

A better understanding of the relationship between nature connectedness and nature belongingness, and pro-environmental behavior intentions

Nature as community and nature connectedness involve a sense of belonging, or a sense of being an insider or part of nature, which might stimulate commitment with conservation through pro-environmental behaviors (Dutcher et al., 2005; Crisp, 2010; Zaradic & Pergams, 2013).

Nature's transformative power works to make people value nature and act more responsibly to conserve it (Schultz, 2000; Mayer & Frantz, 2004; Balmford & Cowling (2006); Nisbet et al., 2009; Maller et al. (2010); Cervinka et al., 2011; Swaisgood & Shepard, 2011; Zelenski & Nisbet, 2014; Zylstra et al., 2014).

Consistent with the above studies, the present study contends that visiting a protected area may foster an ethic that motivates people to become more engaged citizens and take responsibility for conserving nature and protected areas. To test that assertion, this research explored the influence of two constructs - nature connectedness and nature belongingness - on pro-environmental behavior intentions in the context of outdoor recreation in a Brazilian protected area.

The conceptual model proposed (Figure 2) hypothesized the direct and positive effect of NC and NB on PEBI and an indirect effect of NB on PEBI through NC. However, that model could not be tested because there was a lack of discriminant validity between NC and NB. Nevertheless, the reliability and validity of the NC, NB, and PEBI scales, when tested individually, were verified when using both pre and post-experience data. Those results allowed the researcher to test the relationship between the constructs using multiple regression.

Multiple regression was used to test the association between the summated scales NC and PEBI, adding to the equation six covariates. Results provided evidence that NC and the covariates explained 33.3% of the variance in PEBI. NC and Q9 (number of times participants visited a protected area in the last two years) significantly predicted PEBI. The analysis showed an increase in PEBI for those used to recreating in protected areas relative to those not used to it (if all the other variables are kept constant). The same pattern was found for the association between PEBI, the NB summated scale, and the covariates tested. Results showed that NB and

the covariates explained 30.2% of the variance in PEBI, and NB and Q9 significantly predicted PEBI. Therefore, this research has demonstrated that PEBI increases if either connectedness or belongingness increases. That is important since both constructs can be stimulated through visitation-sensitive management in protected areas, offering immersive experiences to visitors in conserved nature. Moreover, this study has added a new tool to the toolbox for understanding the human-nature relationship, the NB scale, which can be stimulated and, in turn, stimulate and predict people's intentions to behave pro-environmentally.

A better understanding of the impact of the experience in a protected area on visitors' nature connectedness, nature belongingness, and pro-environmental behavior intentions.

Pre/post scale tests were applied to a random sample of domestic visitors in Parnaso to assess the effect of an experience in nature in NC, NB, and PEBI. The three scales were applied to the sample before and after the experience in the park. Based on the literature review and the purpose of the present study, the supposition was that the park experience would positively impact the three constructs, demonstrated by higher scale scores after the visit.

For NC, the averaged summated scores were above 4.5 before and after the experience, remembering that NC was a 5-point Likert type scale. All the individual items also had a mean score above 4.0. Concerning NB, the averaged summated pre- and post-experience scores were higher than for NC. The NB individual items also had higher mean scores than the NC scale, showing that participants felt welcomed in the park, felt good being in nature, and as part of nature.

It is out of this study's scope to understand participants' previous life experiences and the facts that could shed light on the cause of that strong self-assumed nature connection and belongingness. However, the high percentage of participants (76.1%) who were used to spending

time in natural areas for recreation help explain the high connectedness and belongingness scores. That result showed consistency with previous studies that have proved that spending time in nature strengthens a relationship with nature (Schultz, 2002; Nisbet et al., 2009; Perkins, 2010; Halpenny, 2010; Zylstra et al., 2014).

A final interpretation concerns emotional and psychological feelings linked to the experience and setting attributes, such as scenic beauty; those feelings are conditional on the physical, social, and cultural contexts in which experiences occur. As mentioned before, Brazilian cultural values are centered around affect and emotion (Poelzl, 2009; Branco & Williams, 2008). Those cultural aspects and the fact that respondents were in the park when they participated in the study may have influenced participants' responses. For example, suppose one compares the high NC mean scores reached by Brazilians with the four studies performed by Nisbet and Zelenski (2013) on connectedness. In that case, one can verify that Canadian participants in those authors' studies, the majority being young students and middle-aged managers who completed the scale in the laboratory or online (the same scale used in the present study - the 6-item scale by Nisbet and Zelenski), scored around 3.4.

In this study, the supposition that there is an improvement in connectedness as a result of experiencing nature was not always verified: of the participants who answered the pre and post surveys, only 35% scored higher in NC after the experience in the park, while 28% scored lower, and 37% achieved the same score before and after the visit. That means that the park experience made the hypothesized effect (an increase in NC score, even if very low) but only for 35% of participants. Therefore, the experience may have reinforced participants' relationship with nature. Still, in some cases, it reduced it for unknown reasons (considering that 71.7% of participants evaluated the experience in Parnaso as excellent, while 24.5% considered it very good).

Indeed, and paralleling Zylstra et al. (2014), connectedness is not an onward and upward unidirectional path; personal and contextual variables influence that construct. The process of acquiring connectedness depends on sustained experiences in nature, resulting in improvements or even periods of connectedness regression. However, overall and as a process, the continued visits operate to strengthen connectedness.

Concerning the NB scores, a pattern could be observed: only 24.2% scored higher on the NB scale after the park experience, 23.4% scored lower, and 52.4% scored the same before and after the trip. Therefore, about as many people gained a sense of belongingness as reduced it, and half of the sample got no increase nor decrease on scores (for one-third of this group, that happened probably because of ceiling effects, since they scored the highest point, 5, before and after the experience).

The lowest summated mean scores were found for the PEBI scale, using pre or post-experience data, although both means were over 4.0. Weighing the three scales, the individual item with the lowest mean score (below 4.0) was the PEBI item Q19_7 (I intend to support parks, reserves, and other protected areas by volunteering my time). Interestingly, those results could suggest that a strong relationship with nature does not always lead to intentions to act in favor of protected areas. The results for Q19_7 could also have been influenced by the fact that Brazil has no strong volunteerism culture (although it is slowly increasing).

Most participants (45.0%) scored higher on PEBI after their experience in Parnaso, while 29.0% scored lower, and 26.0% scored the same before and after the experience. As the results suggest, in the case of PEBI, there is a different pattern compared with the two other constructs; the park experience did seem to make a difference for the majority of participants on intentions to behave pro-environmentally.

ANOVA and post hoc comparison tests for PEBI indicated that age and frequency of visits to protected areas significantly influenced that construct. For example, those used to visiting protected areas scored significantly higher in PEBI than those who were not used to it, and PEBI for those from 30 to 49 years old were significantly higher than those from 18 to 29.

Paired sample t-tests were the statistical procedures used to analyze the mean scales' scores, considering the two sets of observations (pre and post-tests). There was no evidence that the mean scores before the experience were significantly different from the mean scores after the trip for the nature connectedness and nature belongingness constructs. Curiously, exploring the qualitative data, most interviewees affirmed that there is always an improvement in connectedness due to a visit to a protected area. Some even argued that a positive impact might be more robust for those who are not frequent visitors, such as first-time users. However, this study's quantitative analysis did not find a relationship between first-time visitors and increasing nature connectedness.

It is important to highlight that participants started very high on the NC scale, indicating they felt already highly connected before visiting the park. Indeed, there was very little room to move up. Those results could suggest that the observed variables (scale items) were not measured highly enough (in this case, scale items were measured from 1 to 5 points). Scores clustered around the top (5) because participants could not respond any higher or had no room for improvement (ceiling effect), resulting in insufficient variation in the data and no detection of some real effects of the experience on NC. Future research could try seven-point scales, as Orsini and Hulbert (2015) and Howe (2018) recommended. Learning Effect (Aussems et al., 2011) was another potential issue because participants wanted to appear consistent when answering the same questions in the pretest and the posttest.

However, a paired sample t-test did show evidence that the PEBI mean score after the experience was statistically significantly higher than the PEBI mean score before the park experience, which is consistent with previous studies (Halpenny, 2010; Gifford & Sussman, 2012; Sawitri et al., 2015). Testing for PEBI individual items, four of them passed the tests, including two general PEBI items (“Learning more about the natural environment and how to help solve environmental problems” and “Reducing energy and water consumption”) and two park-specific PEBI items (“Supporting parks, reserves, and other protected areas by volunteering my time” and “Picking up the trash people throw on the trail while I am visiting a protected area”). That indicated that PEBI means for those items after the trip were significantly higher than the mean scores before the trip. It is important to emphasize that, although the variable about volunteering to support protected areas had the lowest mean score before and after the trip compared with the other scale items, the t-test showed that the experience positively influenced the intentions to support parks through volunteering.

Therefore, while the mean PEBI was significantly higher after the park experience, there was no evidence that the mean NC and the mean NB were significantly different before and after the trip. That suggests that although both constructs positively affected PEBI, as indicated by the regression results, other aspects related to the park experience influenced the PEBI score change. To gather some understanding of those aspects, an analysis of participants' experiences using qualitative data offered some insights, as shown below.

Improvement in understanding the characteristics of experiences in a protected area and the setting attributes that would stimulate connectedness, belongingness, and pro-environmental behavior intentions.

Participants' ESM answers and phone interview data were analyzed to illuminate the aspects of the visit that participants related to the NC, NB, and PEBI constructs. This qualitative part of the study was helpful to clarify and improve the analysis, providing the depth of understanding that the quantitative analysis lacked. Moreover, using that approach was a call of many previous studies, such as Jorgenson and Nickerson (2016), that asserted that diving deeper into visitors' experiences and linking the results with quantitative data would uncover important information for management.

Respondents linked setting attributes (especially the biophysical and managerial ones) to internal feelings or positive psychological outcomes due to the experience in the park. The setting attribute considered most important was the protected area's conservation status. In Parnaso, the little visible change in the natural environment allowed visitors to have more profound experiences, feel immersed in nature, and have a sense of wellbeing that they could only feel in that kind of environment. Indeed, many authors have asserted that feeling immersed in nature must be encouraged since it presupposes a change in consciousness that may work to strengthen belongingness and connectedness, improving the sense of wellbeing (Mayer et al., 2009; Maller et al., 2010; Brymer et al., 2010; Hansen-Ketchum, 2010; Nisbet et al., 2011; Restall, 2011; Zylstra et al., 2014; Wolsko & Lindberg, 2013; Tang et al., 2015; Rice et al., 2020; Wolf et al., 2020). Concurrently, participants were positively surprised with the availability of infrastructure, services, and activities to support visitation and staff to welcome visitors, maybe because it is not the regular visitation context of protected areas in Brazil. From interviewees' answers, one can infer that they valued that the park has allowed people to experience that conserved environment by organizing the structures and staff for welcoming them.

Participants considered the aspects mentioned above vital to help them pay attention to the park's environment, interact with it, and learn from it, opening space to a greater awareness of the person-environment relationship. It is important to highlight that feeling immersed in nature, interacting with nature, and acquiring a sense of wellbeing are all consequences that are best assured by providing a diversity of setting opportunities. From there, visitors select the dimensions of the experience (adventure, challenge, solitude, stress release, companionship, appreciating nature, freedom, escape) they consider essential to building their experience in those settings (McCool, 2006; Williams, 2007). Feeling good and comfortable in the natural environment seems to stimulate a better understanding of nature and a personal disposition to visit more times and invite friends to visit protected areas, eventually advancing belonging and connectedness. As Williams (2007) and Capaldi et al. (2015) pointed out, and this study has confirmed, for most participants, the outcomes of their outdoor experience were the immediate emotional reactions and changes in wellbeing that persisted beyond the setting to the individual's daily life.

Other aspects that helped participants choose a protected area to visit instead of any other natural sites were security and cleanness (no trash on trails, for example). Feeling safe and being in a clean environment helped them enjoy the experience.

From one participant's perspective, those who were not comfortable in the natural environment or felt like being over-challenged by the difficulty level of the park's activities might have had their connection hindered. That might help explain why, for some participants, connectedness decreased or stayed the same after experiencing the park, as this study's results have shown. However, based on the interview data, most participants agreed that each recreational experience in natural areas improves or reaffirms their relationship with nature,

mainly when it happens in a protected area. Thus, for interviewees, connectedness is part of a process and is not a result of only one visit.

The vast majority of participants recognized that visiting protected areas has positively influenced their beliefs about nature conservation, stimulating respect for nature and protected area support. Those findings answer the call for more research on the potential outcomes for protected areas and general environmental conservation due to visitation and are consistent with the studies by Russel and Russel (2010), Halpenny (2010), Zaradic and Pergams (2013), Moyle et al. (2017), Larson et al. (2015), and Jorgenson and Nickerson (2016).

Participants pointed out that visitation improves awareness and helps build a new perspective on conservation, especially on behaviors related to less pollution, less water consumption, and trash separation for recycling. Some mentioned they have learned from other visitors and have changed some bad behaviors, such as bringing home natural souvenirs from the park. One participant pointed out he has learned about environmental behaviors due to volunteering in protected areas; he realized how much plastic ends up polluting the sea during a volunteer action in a marine national park and decided to reduce the garbage he produces at home.

Although they had affirmed their intentions to support protected areas, most respondents could not point out what they could do to support them. They recognized not being used to taking concrete actions in favor of those areas, nor did they know how to support them. Consistent with Gifford and Sussman's (2012) study, that result could suggest that environmental intentions do not always end up in concrete behaviors and are probably related to individual and social determinants. Therefore, protected area managers need to improve communication with visitors to make it more transparent how visitors can integrate with and support protected areas.

Conserving those areas presupposes society's involvement, so it is important to let visitors know many ways to support them. Few participants expressed how they would support parks: visiting more, encouraging friends to visit, and paying more expensive entrance fees to contribute to the protected areas' maintenance and preservation.

According to participants, visiting parks reinforces the understanding that we depend on nature to live and brings more people to the conservation side. In Parnaso, the aspect that most influenced those thoughts was the park's excellent conservation status, as mentioned before, associated by participants with *the greatness of nature*, which made them feel a small part of the big whole besides feeling emotional before what they defined as *nature's power*.

Integrating quantitative and qualitative results, one can realize that participants who increased their PEBI score after the experience seemed more comfortable in the natural environment, which helped them pay attention and value nature's details. They also seemed to be more mindful of the importance of preserving clean water and the park's role in making that happen. Those who were not influenced positively concerning their intentions to behave pro-environmentally reported different feelings; they highlighted a sense of accomplishment for overcoming a challenge in the park (like doing activities they were not used to do) or reaching a goal (often a vista point). They referred to that good feeling as actively participating in outdoor activities, feeling self-sufficient, proud of themselves, and realizing the park's nature as a friendly environment. This information is important because it suggests that providing a friendly natural environment is a key management strategy to provide a significant visit, potentially stimulating over time new perspectives in intentions to behave pro-environmentally.

LIMITATIONS REGARDING THE STUDY DESIGN

Due to time, funding, and staff limitations, this study's sampling occurred only in one national park (Parnaso) and during only one season (July and August 2018, wintertime in Brazil). However, there are two main touristic seasons to the area (winter and summer), and the visitor profile is different comparing the two seasons. Therefore, visitors in the winter season may not be representative of all visitors in the park.

The limitations mentioned above also impacted the NB scale pre-test, which, if done before the fieldwork, could have potentially helped revise and improve the scale items, avoiding the lack of discriminant validity with NC, which was another construct of the proposed model.

One unexpected obstacle worth mentioning: it was not easy to translate the NB scale into English, especially one item concerning emotions about nature (the items were proposed for this study initially in Portuguese). The emotional aspect always seemed to reflect stronger feelings in Portuguese than in English. To illustrate that, some participants, when asked if they get emotional about nature's beauty, reacted shedding tears while answering yes to the question.

Concerning the quantitative phase and according to Shadish et al. (2002), the present study's approach, a one-group pretest-posttest design, hardly achieves causal conclusions because of several threats to internal validity (Bonate, 2000; Shadish et al. 2002; Dimitrov & Rumrill, 2003). Those threats could be, for example, maturation and testing effects, which happen when participants are familiarized with the posttest because of the pretest. Therefore, errors arising from participants could include carryover effects, in which performance on the first test influences subsequent performance. For example, a respondent may remember his or her earlier answers and may wish to appear consistent. The researchers applying this study's survey witnessed that situation a couple of times during the second administration when the answers

seemed not to be determined by the state of the variable of interest but by a motivation to appear consistent over time.

Errors could also have arisen from the administration procedure and could have reduced reliability scores. In this study, especially because many researchers were applying the survey simultaneously, administration errors may have happened, such as variations in procedures among different researchers, besides incomplete instructions offered to visitors (Yu, 2005).

Concerning the ESM questionnaire, one of the main challenges of this kind of approach is recruiting participants and maintaining their motivation during the study. Participants need high commitment levels to comply with the protocol during the sampling period and complete the task (Scollon et al., 2003; Christensen et al., 2003). Thank-you gifts have been used as sources of motivation, although it is difficult to determine the appropriate amount of compensation to improve respondents' participation (Scollon et al., 2003). In the present study, besides stimulating participants by telling them of the importance of the research, they were offered a thank-you gift (Figure 5), as explained in the Methods section. The primary worry was to keep participants' commitment to the three phases of the research (pre+ESM+post, in this order), which was challenging. Some of them were burdened by having to answer the three phases. The thank-you gift offered to those who finished all the three phases worked well for some participants, but it did not work well, or it was not enough a gift for others. ESM is challenging, costly, time-intensive, and more likely than a conventional survey to face attrition (Christensen et al., 2003; Verhagen et al., 2016; Lucas et al., 2021), which indeed happened in the present study.

All visitors approached at Parnaso had a smartphone to run the ESM app. However, the smartphones' memory shortage sometimes impacted downloading the app, as well as the running

out of the battery or effectively run the app during the visit. Those were real problems that affected participation.

MANAGERIAL RECOMMENDATIONS

Together with accumulated research on outdoor recreation, this research has effectively demonstrated that spending time in nature (especially in protected areas) brings many psychological and physical benefits to people and can bring significant and positive consequences to nature conservation. Protected area managers can influence those outcomes, which depends on the socio-cultural and political context and managers' skills (Weber & Anderson, 2010; Lin & Lockwood, 2014; Watson et al., 2011; Korpela et al., 2014; and many others).

In Brazil, managers must ask themselves what they expect as outcomes of the visits. Suppose the primary objective is to stimulate commitment to protected areas conservation, as they often say. In that case, they need to understand what kind of opportunities to offer to increase the probability of reaching that outcome by, for example, strengthening visitors' relationship with nature through belongingness and connectedness. In that sense, the following recommendations aim at stimulating a reflection on these themes and the debate among managers and decision makers to help improve management practices in outdoor recreation in Brazil. Paraphrasing Selin et al. (2020), new meanings, tools, and frameworks are needed to strengthen the ability of protected area managers to deal with visitation, offering meaningful opportunities for visitors.

Recommendation 1: Providing a welcoming, friendly, and inclusive environment.

As stated before in this study, visitation to protected areas in Brazil has been historically seen as less significant when compared to other protected area management actions. For many

years, visitors were not welcomed, and consequently, in 2018, only 38 of 72 Brazilian National Parks recorded visitor numbers, and few of them offered adequate infrastructure for public use (Souza et al., 2018). However, due to the hard work ICMBio has been doing to improve visitation monitoring, in 2019, there were 137 (from 334) protected areas recording visitor numbers, being 54 national parks (an increase of 42% compared with 2018; ICMBio, 2020b). This study contends that beyond efforts to open protected areas to visitation and improve the monitoring of visitation numbers, it is necessary to step forward and qualify the outdoor experience in the sense that visitors feel welcome, respected, necessary, and part of the park community. This study agrees with the perspective of Jorgenson & Nickerson (2016) when they say that visitors must feel welcome instead of feeling like being "allowed" into a protected area. Parks need to be welcoming and inclusive places, offering a friendly environment where all visitor profiles are stimulated to connect with nature through a sense of belonging to nature. Connecting individuals to nature through meaningful park experiences should be a central theme in visitor management in Brazil; discovering how to do that needs managers, protected areas' councils, volunteers, local people, and academia. Assuring the protected area is well conserved and provides an inclusive, friendly, safe, clean, organized, and well-managed environment, together with activities designed for everybody, seems to be a good start. So, visitors must be valued, respected, and supported through opportunities to visit, interact with nature, and have meaningful experiences.

It is also necessary to extend the thoughts above to the private sector that operates concessions in protected areas. Although those concessions are awarded on the assumption they will operate efficiently, providing high-quality and responsive visitor services, one can never forget one of the important outcomes that agencies must assure of those agreements: help visitors

experience, learn about, and feel the power of nature in their lives. In doing so, visitors will appreciate protected areas and support broader conservation initiatives (UNDP report - Thompson et al., 2014).

Recommendation 2: Providing opportunities for visitors to feel immersed in nature, focused on the experience, and living the experience fully.

This study's qualitative results showed the importance of being immersed in nature to strengthen a relationship with nature. However, "being immersed in nature" can be a different thing for each visitor, and dependent on motivations, level of experience in natural environments, and expectations regarding the experiences they seek. Therefore, it is important to understand different visitor groups (such as climbers, mountain bikers, hikers, appreciative recreationists, family groups, student groups) and how to drive their focus to the environment, which would facilitate immersive experiences. Besides offering cozy environments such as trails, picnic areas integrated with woods, and lookouts that allow visitors to admire the most beautiful views of the protected area, the protected area should also invest in informative signage containing messages to encourage immersion. The messages could appeal to nature's beauty and the emotion of being in nature (this would work in the Brazilian case) and encourage visitors to realize a sense of wellbeing in that environment.

2a. Stimulating interactions.

As Kahn et al. (2010) already pointed out, managers should provide profound interactions with nature to make the experience more immersive. One essential aspect that should be assured is the sensory quality of the exposure to nature. Although eyesight is the first thing one thinks is fundamental for contact, other modalities are worth stimulated, such as the auditory, tactile, and olfactory ones (Bratman et al., 2019). Therefore, effective park programming on visitation may

help determine how these sensory pathways can be developed and engaged. An example could be direct contact with water. Brazilians highly value bathing in rivers and waterfalls. So, providing places where people can swim could be an incentive to interact with that environment.

Bratman et al. (2019), Kahn et al. (2010), and Kahn et al. (2018) discussed what they called interaction patterns, meaning the abstract ways people interact with nature which can be applied across different forms of nature. An example can be to trace a track that includes a winding path and a specific spot on the trail where one can feel the strong wind running through the body, see a splendid view, or listen to the sounds of running water. Indeed, those are the parts of a trail that would probably be remembered during experience recollection. Another profound form of interaction with nature is when one experiences its periodicity (Kahn et al., 2010), such as the seasons changing, the day turning to dusk, the waves coming and going, the sunset and sunrise, or listening to the birds at the end of the afternoon in a particular spot in the park.

Interactions in natural environments can elicit many psychological sensations, including "joy, awe, humility, fear, happiness, focused attention, surprise, thoughtfulness, vastness, curiosity, and calmness." (Kahn et al., 2010, p. 63), and all of that can stimulate nature belongingness. Protected area managers in Brazil may think about the forms of interaction they believe are important and viable to promote, considering the context of visitation.

2b. Providing informative and interpretative signage.

This study's participants affirmed that informative and interpretative signage are important allies that can bring their focus to the experience. Besides containing information about aspects of nature in the protected area, signs should remind visitors of how good nature is for their physical and psychological health, how good it is for the spirit and the soul, and messages giving tips on how to achieve the wellness sensation they are looking for. The

following statement suggestions were adapted from Sisson (2020) and are examples of the messages that could be available in strategic locations in parks: "Try to incorporate a bit of nature into your life every single day.", "Make time for extended nature-inspired trips several times a year. Visit your national parks.", "Explore less mainstream areas in the park.", "Go for a walk in the park. Take a nap in the grass or a warm rock. Listen to some nature sounds.", "Nature exposure restores the normal physiological functions and alleviates stress.", "Remember that nature is not just the green. There are plenty of other forms of life here. Try to pay attention to them.", "Try to listen to bird language, to find wildlife tracking, and go wandering freely amongst the trees." and "Try the wonderful feeling of basking in the sunlight on a mossy bed or a warm rock.", "Nature immersion improves your ability to be more aware of the environment. Try it."

In Brazil's particular case, since most Brazilians are considered emotional people, managers could control for inspirational and emotional messages, directly reflected on the interpretation provided or indirectly reflected on the attributes of the settings available for visitation.

Recommendation 3: Stimulating the pride of local people.

The way local people perceive protected areas is reflected in their attitudes towards the natural environment (Gurgel et al., 2009). Therefore, local residents must realize the opportunities of being protected areas' neighbors, such as having easy access to the site for outdoor recreation and environmental learning and realizing improvements in the environmental and economic aspects of the city where the protected area is located. Moreover, protected areas could take advantage of having those neighbors as frequent visitors and stimulate the development of a sense of being part of the park.

Some successful examples from a very few national parks in Brazil (including Parnaso) have stimulated local communities' access (neighborhood populations) to protected areas by lowering entrance fees by around 90% for this specific public. This strategy has worked very well and should be amplified to more protected areas. In the case of Parnaso, for example, locals feel privileged by the park and feel a sense of belonging for participating in a select community of the park. Moreover, managers should be proactive in developing new approaches to improve park access for surrounding schools and increase the participation of underserved local communities. The protected areas' council could help develop strategies to improve communication with those groups and encourage visitation, looking for funding for transportation and affording opportunities for different activities.

Recommendation 4: Programming for family groups and children.

Not so many years ago, in Brazil, children less than six years old were not allowed to enter some national parks. However, the perspective on visitation has been changed, and today protected area managers understand that it is vital to invite the whole family to recreate in the parks, especially the children, to stimulate a familiarity with nature, the awareness about nature, and a sense of belonging to the natural environment. Playing in natural spaces significantly contributes to the integral well-being of children and creates a link between the child and nature. Thus, it is fundamental to partner with organizations and schools committed to developing programs and methodologies to connecting children to nature, promoting environmental learning and healthy experiences for children.

Recommendation 5: Stimulating volunteerism in protected areas.

Volunteering in a protected area is not just an opportunity to exercise citizenship. It is a two-way action since the main objective of this program is to strengthen the volunteer's

relationship with nature, his/her environmental awareness and commitment through the sense of belonging to that environment, and the connection formed with the protected area. There is a volunteer program at the federal level in Brazil in a permanent process of expansion and maturation, which managers of protected areas should valorize since only 50% of these areas have joined the program so far (ICMBio, 2020a). Moreover, volunteers are an important task force to help the management of visitation.

Recommendation 6: Communicating protected areas using technology and social media.

Social media facilitates communication with actual and potential visitors with different motivations and goals, especially the youngsters (Sachdeva, 2020). Therefore, managers should adapt to the rapidly evolving technology and use social media to better engage with visitors (Valenzuela, 2020). People interact virtually with the protected area and other visitors and get to know about activities, events, volunteerism opportunities, fauna, and flora. Besides and more importantly, they share their experiences and become involved in an online community, the protected area's community, engendering belongingness.

In the fieldwork at Parnaso, the researcher verified that 100% of this study's participants had a smartphone, independent of age. So, it is necessary to consider that change in the social context of outdoor recreation, which affects participation and experiences' outcomes. The technology can advance the experience since the user can make a campsite reservation, decide the trail to hike, access interpretive content, use the GPS for orientation, or even feel safer because of the internet connection. However, the technology can also depress the experience by distracting visitors from the focus of the visit and preventing them from interacting with the protected area's nature. That is a challenge that managers have to deal with on embracing technology because it worth it only as long as it enhances visitor experiences (Valenzuela, 2020).

In Parnaso, for instance, visitors can access the internet or make phone calls only at the entrance gates. When hiking the trails and doing other activities in the park, the Smartphones basically take pictures. Nevertheless, up to now, there is no consensus about what works better for the ultimate goal: to stimulate belongingness, connectedness, and conservation commitment. Therefore, there is a call for research in this field; Brazilian managers should discuss their perspectives with their peers and researchers.

Recommendation 7: Building capacity

Capacity building is a strategy that has been successfully used in Brazil in the last years to amplify and qualify visitation. It is recognized that park agencies (especially the federal agency - ICMBio) have evolved in the public use field by empowering park managers on visitation topics. Therefore, capacity building must be continuedly done, and an institutional space should be permanently opened for managers to discuss, share, and learn about the new meanings, tools, frameworks, and strategies to reach the goal of helping visitors to strengthen their relationships with nature.

One recommendation to improve the collective capacity to provide innovative and creative solutions to address visitation challenges is to consolidate the Community of Practice on Visitation in Protected Areas, a collective created in 2015 due to a partnership between the W. A. Franke College of Forestry and Conservation of the University of Montana, ICMBio, the US Forest Service, and USAID. The objective of the community of practice is to promote and strengthen collaboration between researchers and protected area managers in Brazil for the development of research on visitation in protected areas. That collective also aims to stimulate the use of data and information generated by research as a subsidy for visitation management. As

a start, the community could build a research agenda to discuss the recommendations listed above and find ways to benefit management on the ground.

RECOMMENDATIONS FOR FUTURE RESEARCH

This study intends to inspire and invite Brazilian researchers and protected area managers to better understand people-nature relationships using the concepts of nature connectedness and nature belongingness. The research and theory reviewed give hope that these concepts positively influence people's intentions to behave pro-environmentally and that the outdoor experience also impacts PEBI positively. Nonetheless, some questions and research gaps remain, especially concerning the effects of the outdoor experience on connectedness and belongingness and clear differentiation between these two constructs. Therefore, there is a call for future research, which should consider the following proposition:

- Continued research on the human-nature relationship.

This study contends that nature connectedness and nature belongingness are distinct constructs and that consideration of both enables a more nuanced understanding of the human-nature relationship. Future research will help find how to better differentiate them. Moreover, since both constructs positively influence PEBI and help understand the experience in a protected area, as demonstrated in the present study, it makes sense to call for continued research on this field. Therefore, more work should be done to understand the relationship between connectedness and belonging and under what conditions they would differ in addressing PEBI.

- Continued development of the nature belongingness scale

This study provided evidence that the nature belongingness scale helps understand the impact of the experience on intentions to behave pro-environmentally. Future research could work to develop and test new items of the scale to improve its validity. Improving this scale and

testing it in diverse protected areas would provide a more in-depth understanding of how belongingness is affected by a welcoming environment, diverse nature interactions, informative and interpretive signage, technology, and social media. Future research should also continue to develop the understanding of the impact of nature belongingness on PEBI considering other behaviors of interest to conservation social science.

In this study, participants scored high either before or after the experience in Parnaso, indicating they felt strong belongingness to nature even before visiting the park. There are some opportunities to develop more understanding of this construct and how the experience impact it:

1) The scale items were measured from 1 to 5 points, and participants had very little room to move up. Those results could suggest that the observed variables (scale items) were not measured highly enough since scores clustered around the top (5), resulting in insufficient variation in the data. Future research could try seven-point scales, as Orsini and Hulbert recommended (2015), as well as Howe (2018).

2) Future research could test the NB scale in other protected areas and compare the results to learn if they follow the same tendency of high NB scores that were found for Parnaso's visitors.

3) To understand participants' high nature belongingness scores and if those results were biased by any reason (like being in the park, considering that park visitors are already predisposed to being connected and to feeling like they belong), future research could test the scale across multiple populations, including non-national park populations. Researchers could apply the scale to people that are not in a national park and, because of that, may probably be less connected or feel less belonging. Next, they would invite those participants to visit a

protected area. After the visit, the scale should be applied again (pre/post-test), and the results compared to learn if the experience makes a difference on belongingness.

- Continued testing of the nature connectedness scale

Future research should explore differences in levels of nature connectedness when applying the scale to a different study population in different settings (protected areas and urban sites, for example). It would also be important to understand the impact of nature connectedness on PEBI, considering other behaviors of interest to conservation social science in general and park managers in particular.

- Continued research on the park experience

Park managers in Brazil are struggling to provide outdoor activities to people, not necessarily experiences. This study offered theoretical and empirical information on visitor experiences, exploring the potential effects in connectedness, belongingness, and PEBI. However, more research is needed, especially in Brazil, to understand if there are "the best" experiences to engender connectedness, belongingness, and PEBI, together with developing frameworks to monitor those effects.

CONCLUSION

Worldwide, researchers and protected area managers have realized that visitation is a key strategy to connect people to nature, bringing benefits to visitors' physical and mental health and conserving those areas. However, the challenge has been to understand the nuances of a people-nature relationship and how to facilitate experiences that can effectively strengthen it.

Therefore, it is important to provide a theoretical base and empirically tested frameworks to collaborate with managers in this endeavor. In this sense, nature belongingness and

connectedness are two dimensions of visitors' relationship with nature worth understanding and stimulate, resulting in appreciation of those areas and stewardship for its adequate conservation.

Despite all threats that nature conservation has been facing in Brazil, the country is in a fruitful moment regarding visitation to protected areas. Park managers seem to be more open to understanding the power of nature to stimulate pro-environment behaviors. Brazilians seem to be more willing to visit, feel nature in their lives, and understand the importance of protected areas for the country and the world. Therefore, this is a Brazil-centered study that highlights the power of a recreational experience in a national park to strengthen public support for nature conservation. Despite that, the results may also offer valuable information for other developing countries interested in improving visitor-nature bonds. More importantly, the understanding of the nature belongingness construct and its potential to enhancing relationships with nature may provide one more tool to the toolkit of the applied field of conservation social science to advance protected area management.

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APPENDIX 1: PRE-EXPERIENCE SURVEY, APPLIED BEFORE PARTICIPANTS ENTERED THE PARK

Qualtrics - English Pre-Survey

Start of Block: Consent Form

Hello! My name is Sônia Kinker. I am a Ph.D. student at the University of Montana, and I am working on my dissertation in Parnaso with the support of CNPq (a research foundation in Brazil). My study aims at understanding the relationship visitors build with nature through their visits to national parks. The study is divided into three phases: the first one is applied before you start experiencing the park; the second one happens during your visit to the park and depends on you downloading an app into your smartphone; the third phase is applied after your visit, and before you leave the park.

Would you like to take part in this study? Each phase will take you around 10 minutes to complete. All your answers are voluntary, and you will remain completely anonymous.

If you agree to participate and complete the three phases, we will be happy to offer you a THANK YOU GIFT!

Thank you!

Q1. Do you consent?

- Yes
- No

Skip To: End of Survey If Do you consent? = No

Start of Block: A remind for the researcher: Please, answer questions 2, 3, and 4 before giving participants the tablet.

Q2. Researcher's name

Q3. Please, write visitor's wristband number

Q4. Place of interview

- Teresópolis Recreation Area
- Petrópolis Recreation Area

Q5. Please, indicate visitor's gender.

- Male
- Female

End of Block:

Q6. Is this your first time in the park?

- Yes
- No

Skip To: Q8 If Is this your first time in the park? = Yes

Q7. How many times have you been in this park?

- 2
- 3
- 4
- 5
- 6 or more

Q8. Do you usually visit other parks and reserves to recreate or enjoy vacations?

- Yes
- No

Q9. How many times in the last two years have you been in other parks, reserves or other protected areas for recreation or vacations?

- 1
- 2
- 3 or more

Q10. How long do you expect to stay in this park today?

- 1 - 3 hours
- 3 - 6 hours
- 6 - 9 hours
- more than one day

Q11. What is your main motivation to be in this park today?

Q12. How many people are in your group?

- Only myself
- 2
- 3
- 4 or more

Q13. Which the options below better describe your group?

- Couple
- Family
- Friends
- Family and friends
- Tourism operator group
- Mountaineering group or other kind of organized group
- Other

Q14. What is your age category?

- 18-29
- 30-39
- 40-49
- 50-59
- 60-69

- 70-79
- 80-89

Q15. Where do you live (city and state)?

Q16. Please indicate your highest level of education:

- Less than high school
- High school
- Some college
- Bachelor's degree
- Master's degree
- Doctorate degree

End of Block

Start of Block: Nature Connectedness Scale

Q17. For each of the following, please rate the extent to which you agree with each statement, using the scale from 1 to 5 as shown below. Please respond as you really feel, rather than how you think “most people” feel.

	Disagree Strongly (1)	Disagree a little (2)	Neither agree nor disagree (3)	Agree a little (4)	Agree Strongly (5)
My ideal vacation spot would be a remote, wilderness area (Q17_1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I always think about how my actions affect the environment (Q17_2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My connection to nature and the environment is a part of my spirituality (Q17_3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I take notice of wildlife wherever I am (Q17_4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

My relationship to nature is an important part of who I am (Q17_5)

I feel very connected to all living things and the earth (Q17_6)

End of Block: Connectedness to nature

Start of Block: Nature Belongingness Scale

Q18. For each of the following, please rate the extent to which you agree with each statement, using the scale from 1 to 5 as shown below. Please respond as you really feel, rather than how you think “most people” feel.

	Disagree Strongly (1)	Disagree a little (2)	Neither agree nor disagree (3)	Agree a little (4)	Agree Strongly (5)
I feel I belong to nature (Q18_1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel comfortable when I am outdoors in nature (Q18_2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel motivated to visit other parks or reserves (Q18_10)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel good when I am in nature (Q18_14)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel welcome when I visit parks, reserves, or other protected areas (Q18_15)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When I am in nature, I get emotional about its beauty (Q18_16)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

End of Block: Belongingness to nature

Start of Block: Pro-Environment Behavior Intention Scale

Q19. Please, rate the extent to which you have the intention of doing the statements below, using the scale from 1 to 5. Respond as you really feel, rather than how you think “most people” feel.

I have the intention of	Disagree Strongly (1)	Disagree a little (2)	Neither agree nor disagree (3)	Agree a little (4)	Agree Strongly (5)
Learning about the natural environment and how to help solve environmental problems (Q19_1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Talking to others about environmental issues (Q19_2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Reducing energy and water consumption (Q19_4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Learning more about parks and other protected areas (Q19_5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Supporting parks, reserves, and other protected areas by volunteering my time (Q19_7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Picking up the trash people throw on the trail while I am visiting a protected area (Q19_8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

APPENDIX 2: POST-EXPERIENCE SURVEY, APPLIED BEFORE PARTICIPANTS LEFT THE PARK

Qualtrics - English Post-Survey

Hello,

We are very glad to see you are back to participate in the third phase of this study, which will take you around 5 minutes to complete.

We appreciate your participation!

Please, after answering the questions below, take with you YOUR THANK-YOU GIFT!

Start of Block: A remind for the researcher: Please, answer question 1 below before giving participants the tablet.

Q1. Please, write here the visitor's wristband number

Q2. How would you rate your visit to this park today?

- Excellent
- Very good
- Good
- Not so good
- Bad

Q3. What did you like the most about your visit to this park today?

Q4. What did you like the least about your visit to this park today?

End of Block

Start of Block: Nature Connectedness Scale

Q5. For each of the following, please rate the extent to which you agree with each statement, using the scale from 1 to 5 as shown below. Please respond as you really feel, rather than how you think “most people” feel.

Q6. For each of the following, please rate the extent to which you agree with each statement, using the scale from 1 to 5 as shown below. Please respond as you really feel, rather than how you think “most people” feel.

	Disagree Strongly (1)	Disagree a little (2)	Neither agree nor disagree (3)	Agree a little (4)	Agree Strongly (5)
My ideal vacation spot would be a remote, wilderness area (Q17_1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My relationship to nature is an important part of who I am (Q17_5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My connection to nature and the environment is a part of my spirituality (Q17_3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel very connected to all living things and the earth (Q17_6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I take notice of wildlife wherever I am (Q17_4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I always think about how my actions affect the environment (Q17_2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

End of Block: Connectedness to nature

Start of Block: Nature Belongingness Scale

Q7. For each of the following, please rate the extent to which you agree with each statement, using the scale from 1 to 5 as shown below. Please respond as you really feel, rather than how you think “most people” feel.

	Disagree Strongly (1)	Disagree a little (2)	Neither agree nor disagree (3)	Agree a little (4)	Agree Strongly (5)
I feel welcome when I visit parks, reserves, or other protected areas (Q18_15)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel comfortable when I am outdoors in nature (Q18_2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel I belong to nature (Q18_1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel good when I am in nature (Q18_14)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

When I am in nature, I get emotional about its beauty (Q18_16)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel motivated to visit other parks or reserves (Q18_10)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

End of Block: Belongingness to nature

Start of Block: Pro-Environment Behavior Intention Scale

Q8. Please, rate the extent to which you have the intention of doing the statements below, using the scale from 1 to 5. Respond as you really feel, rather than how you think “most people” feel.

I have the intention of	Disagree Strongly (1)	Disagree a little (2)	Neither agree nor disagree (3)	Agree a little (4)	Agree Strongly (5)
Talking to others about environmental issues (Q19_2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Supporting parks, reserves, and other protected areas by volunteering my time (Q19_7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Reducing energy and water consumption (Q19_4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Learning more about parks and other protected areas (Q19_5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Learning about the natural environment and how to help solve environmental problems (Q19_1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Picking up the trash people throw on the trail while I am visiting a protected area (Q19_8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

APPENDIX 3: TESTING THE OVERALL MEASUREMENT MODEL USING PRE-EXPERIENCE DATA AND AMOS

ANALYSIS SUMMARY

Groups

Group number 1 (Group number 1)

Notes for Group (Group number 1)

The model is recursive.

Sample size = 471

Variable Summary (Group number 1)

Your model contains the following variables (Group number 1)

Observed, endogenous variables

Q17_6

Q17_5

Q17_4

Q17_3

Q17_2

Q17_1

Q18_16

Q18_15

Q18_14

Q18_10

Q18_2

Q18_1

Q19_8

Q19_7

Q19_5

Q19_4

Q19_2

Q19_1

Unobserved, exogenous variables

e1

e2

e3

e4

e5

e6

e7

e8

e9

e10
 e11
 e12
 PEBI
 e13
 e14
 e15
 e16
 e17
 e18
 NatureBelongingness
 NatureConnectedness

Variable counts (Group number 1)

Number of variables in your model: 39
Number of observed variables: 18
Number of unobserved variables: 21
Number of exogenous variables: 21
Number of endogenous variables: 18

Parameter Summary (Group number 1)

	Weights	Covariances	Variances	Means	Intercepts	Total
Fixed	21	0	0	0	0	21
Labeled	0	0	0	0	0	0
Unlabeled	15	3	21	0	0	39
Total	36	3	21	0	0	60

Models

Default model (Default model)

Notes for Model (Default model)

Computation of degrees of freedom (Default model)

Number of distinct sample moments: 171
Number of distinct parameters to be estimated: 39
Degrees of freedom (171 - 39): 132

Result (Default model)

Minimum was achieved
 Chi-square = 432,757

Degrees of freedom = 132
 Probability level = ,000

Group number 1 (Group number 1 - Default model)

Estimates (Group number 1 - Default model)

Scalar Estimates (Group number 1 - Default model)

Maximum Likelihood Estimates

Regression Weights: (Group number 1 - Default model)

	Estimate	S.E.	C.R.	P	Label
Q19_8 <--- PEBI	1,000				
Q19_7 <--- PEBI	2,251	,268	8,409	***	par_1
Q19_5 <--- PEBI	1,609	,193	8,358	***	par_2
Q19_4 <--- PEBI	1,190	,169	7,039	***	par_3
Q19_2 <--- PEBI	1,976	,224	8,826	***	par_4
Q19_1 <--- PEBI	1,862	,208	8,950	***	par_5
Q18_2 <--- NatureBelongingness	,995	,120	8,303	***	par_9
Q18_1 <--- NatureBelongingness	1,724	,193	8,931	***	par_10
Q18_10 <--- NatureBelongingness	,956	,119	8,042	***	par_11
Q18_14 <--- NatureBelongingness	,587	,073	8,079	***	par_12
Q18_15 <--- NatureBelongingness	,947	,123	7,689	***	par_13
Q18_16 <--- NatureBelongingness	1,000				
Q17_1 <--- NatureConnectedness	,531	,047	11,283	***	par_14
Q17_2 <--- NatureConnectedness	,453	,048	9,463	***	par_15
Q17_3 <--- NatureConnectedness	,949	,078	12,090	***	par_16
Q17_4 <--- NatureConnectedness	,525	,044	12,049	***	par_17
Q17_6 <--- NatureConnectedness	1,000				
Q17_5 <--- NatureConnectedness	,855	,046	18,449	***	par_18

Standardized Regression Weights: (Group number 1 - Default model)

	Estimate
Q19_8 <--- PEBI	,443
Q19_7 <--- PEBI	,655
Q19_5 <--- PEBI	,645
Q19_4 <--- PEBI	,460
Q19_2 <--- PEBI	,747
Q19_1 <--- PEBI	,783
Q18_2 <--- NatureBelongingness	,559

	Estimate
Q18_1 <--- NatureBelongingness	,647
Q18_10 <--- NatureBelongingness	,528
Q18_14 <--- NatureBelongingness	,533
Q18_15 <--- NatureBelongingness	,490
Q18_16 <--- NatureBelongingness	,468
Q17_1 <--- NatureConnectedness	,521
Q17_2 <--- NatureConnectedness	,444
Q17_3 <--- NatureConnectedness	,553
Q17_4 <--- NatureConnectedness	,552
Q17_6 <--- NatureConnectedness	,824
Q17_5 <--- NatureConnectedness	,785

Covariances: (Group number 1 - Default model)

	Estimate	S.E.	C.R.	P	Label
NB <--> NC	,202	,025	8,248	***	par_6
PEBI <--> NC	,141	,021	6,759	***	par_7
PEBI <--> NB	,068	,012	5,702	***	par_8

Correlations: (Group number 1 - Default model)

	Estimate
NB <--> NC	,959
PEBI <--> NC	,585
PEBI <--> NB	,582

Variances: (Group number 1 - Default model)

	Estimate	S.E.	C.R.	P	Label
PEBI	,133	,029	4,645	***	par_19
NB	,102	,020	4,987	***	par_20
NC	,438	,042	10,402	***	par_21
e1	,207	,019	10,797	***	par_22
e2	,199	,017	11,906	***	par_23
e3	,276	,019	14,427	***	par_24
e4	,892	,062	14,419	***	par_25
e5	,365	,025	14,824	***	par_26
e6	,332	,023	14,563	***	par_27
e7	,364	,025	14,603	***	par_28
e8	,289	,020	14,506	***	par_29
e9	,089	,006	14,281	***	par_30

	Estimate	S.E.	C.R.	P	Label
e10	,240	,017	14,306	***	par_31
e11	,221	,016	14,109	***	par_32
e12	,421	,032	13,310	***	par_33
e13	,545	,037	14,616	***	par_34
e14	,897	,069	13,097	***	par_35
e15	,482	,037	13,209	***	par_36
e16	,702	,048	14,545	***	par_37
e17	,411	,036	11,519	***	par_38
e18	,290	,027	10,561	***	par_39

Modification Indices (Group number 1 - Default model)

Covariances: (Group number 1 - Default model)

	M.I.	Par Change
e17 <--> e18	19,473	,087
e15 <--> e17	8,269	-,069
e14 <--> e17	7,812	-,092
e14 <--> e15	22,326	,161
e13 <--> NatureBelongingness	4,477	,018
e13 <--> e18	4,936	-,048
e13 <--> e14	12,394	,123
e12 <--> NatureConnectedness	12,300	,049
e12 <--> NatureBelongingness	17,569	-,030
e12 <--> e17	4,508	,048
e11 <--> PEBI	6,241	-,019
e11 <--> e17	6,414	-,041
e11 <--> e12	6,993	-,040
e10 <--> e15	7,062	,046
e10 <--> e12	5,488	-,037
e9 <--> NatureBelongingness	6,523	,009
e9 <--> e14	4,333	-,030
e9 <--> e11	16,789	,028
e8 <--> NatureConnectedness	5,746	-,028
e8 <--> NatureBelongingness	8,214	,017
e8 <--> e14	4,777	-,056
e8 <--> e12	5,106	-,039
e8 <--> e11	20,616	,056
e8 <--> e10	9,447	,039
e8 <--> e9	4,656	,017
e7 <--> NatureBelongingness	5,132	-,015

			M.I.	Par Change
e7	<-->	PEBI	5,091	,022
e7	<-->	e13	4,329	,044
e7	<-->	e11	5,289	-,032
e6	<-->	NatureConnectedness	9,821	-,039
e6	<-->	NatureBelongingness	5,856	,016
e6	<-->	PEBI	6,045	,023
e6	<-->	e10	43,206	,090
e5	<-->	PEBI	9,416	,030
e5	<-->	e16	36,209	,146
e5	<-->	e9	10,337	-,028
e4	<-->	PEBI	5,034	,035
e4	<-->	e14	5,968	,110
e4	<-->	e12	13,141	,111
e4	<-->	e11	4,600	-,047
e4	<-->	e10	8,173	-,064
e4	<-->	e9	11,675	-,047
e3	<-->	e18	4,114	,031
e3	<-->	e4	6,120	-,060
e2	<-->	e14	4,516	,049
e2	<-->	e10	4,919	-,025
e2	<-->	e9	4,040	,014
e2	<-->	e6	12,853	-,048
e1	<-->	PEBI	8,263	-,024
e1	<-->	e13	7,191	-,049
e1	<-->	e12	7,126	,044
e1	<-->	e8	6,551	-,034
e1	<-->	e2	5,075	,026

Variances: (Group number 1 - Default model)

	M.I.	Par Change
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Regression Weights: (Group number 1 - Default model)

			M.I.	Par Change
Q19_1	<---	Q19_2	7,454	,081
Q19_1	<---	Q18_2	4,519	-,108
Q19_1	<---	Q17_3	4,182	-,052
Q19_1	<---	Q17_5	5,593	-,094
Q19_1	<---	Q17_6	5,287	-,082
Q19_2	<---	Q19_1	6,102	,094

			M.I.	Par Change
Q19_2	<---	Q19_5	4,415	-,076
Q19_2	<---	Q19_7	4,064	-,053
Q19_4	<---	Q18_16	4,239	,119
Q19_4	<---	Q17_2	36,364	,353
Q19_4	<---	Q17_3	4,557	,074
Q19_5	<---	Q19_7	11,425	,092
Q19_5	<---	Q18_10	6,285	,148
Q19_7	<---	Q19_5	11,748	,176
Q19_7	<---	Q19_8	9,631	,175
Q19_7	<---	Q18_15	4,034	-,152
Q19_8	<---	Q19_7	6,268	,069
Q19_8	<---	Q18_16	4,465	,108
Q18_1	<---	Q19_2	4,583	,070
Q18_1	<---	Q18_2	4,534	-,118
Q18_1	<---	Q17_3	10,252	,089
Q18_2	<---	Q19_1	4,705	-,056
Q18_2	<---	Q19_2	7,948	-,066
Q18_2	<---	Q18_14	11,410	,215
Q18_2	<---	Q18_15	15,035	,141
Q18_10	<---	Q19_5	5,281	,059
Q18_10	<---	Q18_15	6,886	,099
Q18_10	<---	Q17_1	29,435	,187
Q18_10	<---	Q17_3	5,711	-,049
Q18_14	<---	Q19_7	4,641	-,024
Q18_14	<---	Q18_2	10,846	,082
Q18_14	<---	Q17_2	8,732	-,062
Q18_14	<---	Q17_3	8,511	-,036
Q18_15	<---	Q18_2	13,307	,163
Q18_15	<---	Q18_10	6,461	,112
Q18_16	<---	Q19_4	4,321	,062
Q18_16	<---	Q19_8	6,487	,088
Q17_1	<---	Q19_1	5,962	,077
Q17_1	<---	Q19_5	4,300	,062
Q17_1	<---	Q18_10	31,305	,263
Q17_1	<---	Q17_5	4,035	-,076
Q17_2	<---	PEBI	5,173	,192
Q17_2	<---	Q19_4	38,282	,185
Q17_2	<---	Q18_14	7,296	-,217
Q17_3	<---	Q19_4	4,101	,096
Q17_3	<---	Q19_7	7,423	,097
Q17_3	<---	Q18_1	6,517	,134

			M.I.	Par Change
Q17_3	<---	Q18_10	5,878	-,188
Q17_3	<---	Q18_14	8,268	-,366
Q17_3	<---	Q17_4	4,050	-,143
Q17_4	<---	Q17_3	4,037	-,044
Q17_5	<---	Q17_1	9,052	-,102
Q17_6	<---	PEBI	4,780	-,158
Q17_6	<---	Q19_1	6,193	-,069
Q17_6	<---	Q19_5	5,293	-,061
Q17_6	<---	Q19_8	10,531	-,095
Q17_6	<---	Q18_15	4,924	-,087

Model Fit Summary

CMIN

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	39	432,757	132	,000	3,278
Saturated model	171	,000	0		
Independence model	18	2794,099	153	,000	18,262

RMR, GFI

Model	RMR	GFI	AGFI	PGFI
Default model	,038	,903	,875	,697
Saturated model	,000	1,000		
Independence model	,195	,390	,319	,349

Baseline Comparisons

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	,845	,820	,887	,868	,886
Saturated model	1,000		1,000		1,000
Independence model	,000	,000	,000	,000	,000

Parsimony-Adjusted Measures

Model	PRATIO	PNFI	PCFI
Default model	,863	,729	,764
Saturated model	,000	,000	,000
Independence model	1,000	,000	,000

NCP

Model	NCP	LO 90	HI 90
Default model	300,757	241,518	367,603
Saturated model	,000	,000	,000
Independence model	2641,099	2473,215	2816,324

FMIN

Model	FMIN	F0	LO 90	HI 90
Default model	,921	,640	,514	,782
Saturated model	,000	,000	,000	,000
Independence model	5,945	5,619	5,262	5,992

RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	,070	,062	,077	,000
Independence model	,192	,185	,198	,000

AIC

Model	AIC	BCC	BIC	CAIC
Default model	510,757	514,043	672,796	711,796
Saturated model	342,000	356,408	1052,481	1223,481
Independence model	2830,099	2831,616	2904,887	2922,887

ECVI

Model	ECVI	LO 90	HI 90	MECVI
Default model	1,087	,961	1,229	1,094
Saturated model	,728	,728	,728	,758
Independence model	6,021	5,664	6,394	6,025

HOELTER

Model	HOELTER	
	.05	.01
Default model	174	188
Independence model	31	34

APPENDIX 4: ESM DATA TABLE (the highlighted texts were the original quotes used to support the emerged themes and subthemes in the qualitative data analysis section).

QUESTION	PEBI SCORE I (INCREASE) D (DECREASE) N (NEUTRAL)	WRISTBAND NUMBER	ANSWERS
1) Why have you chosen this image to represent a memorable moment of your visit?	I	363	<i>What caught my attention was the blue sky, which is impressive.</i>
		363	<i>Because I expect to see coatis.</i>
		363	<i>Because the sign explains about coatis and there is a possibility to see them here.</i>
		363	<i>I like the sound of running water; I found this place beautiful.</i>
		378	<i>The place where I am now (Ceci Peri well) is so beautiful; this environment makes me feel at peace.</i>
		412	<i>I'm at the lookout point of 360 Trail. I chose this image because it shows the grandeur of the place, the landscape.</i>
		412	<i>I'm on the main road in the park, and the flowers caught my eye. I love the flowers.</i>
		412	<i>The image reveals different forms of life; species diversity.</i>
		412	<i>Because the image reveals the purity of the water.</i>
		426	<i>I am at the Pedra do Sino summit and the landscape is stunning.</i>
		426	<i>The image represents the preservation of drinking water for the planet.</i>
		426	<i>I chose this image because I liked the location, the landscape, and the photo.</i>
		428	<i>Place that I always visit, and that reminds my family.</i>
		428	<i>I like this place in the park because in here I stop thinking about my life's problems.</i>
		428	<i>Wonderful place in the park where I always take a picture; each photo of the same point is always different from the other.</i>
		432	<i>It was our dream, my husband's and mine, to hike the Pedra do Sino trail.</i>
		444	<i>I love the landscape.</i>
		444	<i>The view is fantastic.</i>
		444	<i>It was one of the most beautiful sunrises I've ever seen.</i>
		444	<i>I liked the place and had a sense of accomplishment for hiking the trail.</i>
451	<i>People in contact with nature.</i>		
457	<i>Because the grandeur of the place enchanted me.</i>		
457	<i>I chose this image because I stopped walking only to admire this plant, so different and beautiful! It is different from all I have seen!</i>		
457	<i>I'm by the waterfall, where my friends and I have sat to talk about nature, the water, and the moment we are living on this trip.</i>		

		457	<i>Because we are waiting for the eclipse at this location. So, I took a photo of the mountains, and the picture shows how small we are.</i>
		459	<i>I chose this picture to show the expectations and joy of friends going on a trail; we are hiking the Pedra do Sino trail, and we will return today.</i>
		459	<i>Cool place to rest.</i>
		459	<i>Because it is an excellent place for relaxation.</i>
		459	<i>Place of arrival and meeting of all hikers.</i>
		490	<i>I am on the Suspended Trail, and it is as if the trees and their tops are embracing me.</i>
		490	<i>I feel very good at watching waterfalls and listening to water sounds; it is a reassuring feeling.</i>
		490	<i>We are having fun at the Finger of God!</i>
		534	<i>Because our adventure begins here!</i>
		534	<i>The picture shows the second stop on the way to Pedra do Sino.</i>
		534	<i>This image shows our third stop on our way to Pedra do Sino. We are at Vêu de Noiva waterfall. Seeing how small we are compared to the world.</i>
		534	<i>The sunrise seen from the Pedra do Sino.</i>
		552	<i>Because the picture shows an ideal place for picnics.</i>
		552	<i>I love being able to walk the rocks along the river to discover new places; it is an adventure.</i>
		556	<i>I took this photo to show that we are all part of nature.</i>
		556	<i>My little child loved this place.</i>
		556	<i>Because it shows the interaction with nature and how nature serves as a place where children can play healthily.</i>
		556	<i>I chose this image because it shows the breadth, the greatness of nature.</i>
		591	<i>Because this place symbolizes the beginning of the journey in the park.</i>
		591	<i>I chose this place because the picture shows a little bit about how perfect God is.</i>
		599	<i>I took this photo on the way to Pedra de São João, after passing Pedra das Cruzes' base. I chose this photo because it represents the adventure I am living; it was necessary to use a rope to assist in the climb, which was an additional challenge.</i>
		599	<i>Because the photo represents the mountaineering club, called CET - Centro Excursionista Teresopolitano, of which I am a member. We always celebrate the climbing of a new summit by taking a picture of the group.</i>
		599	<i>Because the view is stunning.</i>
		599	<i>Because it is possible to see the city of Teresópolis and the mountains of the Três Picos State Park in the background.</i>
		623	<i>Because I was very welcome by volunteer Thais, and she is teaching me about a conservation project which I really like.</i>

		623	<i>Because I learned a lot about the inhabitants of bromeliads with the help of a park's volunteer! Frogs and tree frogs that inhabit bromeliads and act in ecological balance are being harmed by the amount of garbage deposited in bromeliads by visitors.</i>
		623	<i>Because I love wildlife!!!</i>
		623	<i>I chose to photograph the Suspended Trail because I found the idea of the trail really cool.</i>
		626	<i>The photo shows the integration of wildlife and people, perhaps for the wrong reason, but still in harmony with the place.</i>
		626	<i>Because this place is lovely.</i>
		645	<i>Because water is a precious asset that we must preserve.</i>
		645	<i>We found a plastic bag stuck in the roots of the trees, inside the river.</i>
		645	<i>Because I think people should walk this path to have the opportunity to observe nature better.</i>
		650	<i>Grandiosity of nature.</i>
		672	<i>For me, getting to the lookout was a challenge that I overcame, and I'm happy for that.</i>
		678	<i>I'm on the trail to Pedra do Sino, and the photo of this flowered bromeliad reflects my connection with nature.</i>
		678	<i>The image represents birth and life.</i>
		687	<i>I found this spot and these trees on the Trail 360 very beautiful.</i>
		687	<i>Because I wanted to show that everything is very well signposted.</i>
		687	<i>I'm at the camping site. The night at the tent was tense because I was freezing. So, I chose the photo of the tent. But considering the fantastic experiences I had on this tour, it was worth it!</i>
		40063	<i>I chose this point to remind myself that I was already exhausted but that the landscape was worth all the effort!</i>
		40063	<i>To portray this wonderful cloud.</i>
		40063	<i>To remember this water point, which was important on the hike.</i>
		40063	<i>The group chose this spot on the trail for resting.</i>
		40113	<i>The joy of having completed the proposed route, and with incredible people.</i>
		40113	<i>We finally arrived at Açu ... Incredible view. Wind, sun, God in his best expression. The connection with divine art.</i>
		40113	<i>Because it shows a perfect landscape, as in the whole trail.</i>
		40113	<i>Because the sound of the water makes me feel tranquil, peaceful.</i>
		40113	<i>I chose this photo because of the stunning view.</i>
		40114	<i>Because it's the first wide view I have of the region from the trail.</i>
		40114	<i>I am at Dinosaur Hill on the second day of the Petropolis-Teresópolis trail. It's the first open sky moment of the day, and the landscape is incredible.</i>
		40131	<i>This is the first cool view of the trip; it conveys the idea of what is to come. Expectation.</i>

		40131	<i>I am at the "Thanks to God" sign, and although I am not religious, the phrase touched me somehow. In fact, there must be a greater power capable of creating something so beautiful.</i>
		40146	<i>The joy of completing the first stage of the crossing with my wife and friends enjoying the sunset.</i>
		40146	<i>The image shows what enchanted me the most during the Petro-Terê crossing, which are the different mountain layers that we can admire on the horizon.</i>
		40146	<i>Our rest moment after the long hike.</i>
		40146	<i>An incredible view on the horizon and life sprouting between the rocks. Two great examples of the force of nature.</i>
	D	455	<i>Being next to a waterfall, I found the place beautiful.</i>
		455	<i>To show the beauty of the view, which shows the city of Teresópolis surrounded by green.</i>
		455	<i>Because I found the place beautiful.</i>
		455	<i>I chose this picture because of the integration with nature that the Suspended Trail provides.</i>
		557	<i>I found the sunlight on the foliage beautiful.</i>
		557	<i>Because this image shows nature's grandiosity.</i>
		557	<i>I chose this photo because of the possibility of seeing wildlife in its natural habitat.</i>
		600	<i>This photo shows that we reached our goal to arrive at Pedra do Sino with just two stops to rest along the way. Now let's go down.</i>
		600	<i>It is a cozy place to rest.</i>
		600	<i>This photo shows a beautiful image of the mountain, which encourages me to move on.</i>
		40066	<i>This photo shows the reward of the first day of the crossing: Açú Castles.</i>
		40066	<i>The image shows the grandeur of the Garrafão Stone. Superb, strong image.</i>
		40066	<i>The sentiment that the end is not always a negative feeling (this was the most exuberant end of the day/sunset I have ever seen).</i>
		40066	<i>Because this is a place in the Park that few people know. And because the view from this point is incredible.</i>
		40083	<i>I am at the park's entrance gate, being very welcome.</i>
		40112	<i>This image is synonymous with peace.</i>
		40117	<i>I chose this image because it is one of the moments I most appreciate on the mountain: the sunset. In addition to ending an entire day of walking, it is so cool to see my clients overcome themselves and have the privilege of contemplating the day's farewell.</i>
		40117	<i>I chose this image because I consider this one of the most beautiful stretches of the trail, and for this particular time, the weather was good, and the sky opened when we were passing by. Every time I guide people to this place, they feel ecstatic.</i>
		40117	<i>The image means the outcome of a day full of challenges overcome.</i>

		40117	<i>For the joy of the group.</i>
		40148	<i>I have chosen the image because of the geological marvel of the fractures that formed this stone structure.</i>
		40148	<i>Overcoming early waking in the cold.</i>
		40148	<i>I chose this image because I was exhausted at that point but very happy.</i>
		40148	<i>Because I love the exotic geological features.</i>
		40149	<i>This image represents achievement and satisfaction for having hiked the trail and arrived at Açú.</i>
		40149	<i>I have chosen this image because it represents this park's immensity, the joy of seeing the sunset, and have achieved a goal.</i>
		40149	<i>The image shows the courage to beat the cold and wake up early to see the sunrise wonders.</i>
		40149	<i>The image shows my fascination with geological processes and the beautiful landscapes they offer us.</i>
	N	366	<i>Because the landscape is wonderful.</i>
		366	<i>I found the arrangement of the branches interesting.</i>
		366	<i>I love the tree shapes, and I found this one super different.</i>
		366	<i>I love the paths through the forest; they make me feel calm.</i>
		369	<i>Taking pictures of nature is like having a painting painted by the best artist and without paying anything.</i>
		369	<i>If you enlarge the image, you can see a snake. That is cool!</i>
		400	<i>I like to photograph the details that nature offers us.</i>
		400	<i>This image shows the park's care with the trail.</i>
		427	<i>The image shows one of the first points of the rock-climbing class at the Cabeça de Peixe rock.</i>
		427	<i>The arrival at the summit is always amazing!!! And shows unparalleled beauty!</i>
		427	<i>This photo represents a goal to be achieved because I can see God's Finger right in front of me, which is my next challenge.</i>
		454	<i>Friendships made during a journey in nature.</i>
		454	<i>This photo makes me feel good. I'm hiking an easy trail with my boyfriend.</i>
		454	<i>This image indicates the beginning of the adventure.</i>
		454	<i>This image indicates the satisfaction of completing my journey to the Postcard Trail's lookout point.</i>
		622	<i>I'm at the Suspended Track trailhead, and I found the place very beautiful.</i>
		622	<i>I found it interesting to see coatis walking around freely and the visitors' relationship with wildlife.</i>
		40069	<i>Water and shadows ... May the projections flow as the river flows ...</i>

		40069	<i>I think it was to see and feel this emotion that I came here, at the Açú shelter.</i>
		40069	<i>I found the shape of this plant unique; it seems like a flower. I am excited to be still able to see and perceive beautiful things, even though I am so tired.</i>
		40069	<i>A farewell to the crossing. New Horizons.</i>
		40084	<i>I found the view very beautiful - I like to see and feel nature's immensity.</i>
		40084	<i>The image symbolizes our adventure.</i>
		40084	<i>The image symbolizes the overcoming of a challenge.</i>
		40091	<i>The photo demonstrates the overcoming of a challenge and recognizing my own willpower.</i>
		40091	<i>The image shows God's wonders and their colors, and the splendor of nature.</i>
		40091	<i>I chose the image because of the fullness and magnificence of God; we are at the Portals of Hercules, looking at the Devil's Needle.</i>
		40091	<i>The image reveals the end of the effort and the endpoint of the Petro-Tere crossing.</i>
2) What does this image convey to you?	I	378	<i>The image conveys peace.</i>
		412	<i>The image conveys the perfection of divine creation.</i>
		412	<i>The photo conveys respect and admiration for nature.</i>
		412	<i>The image conveys an awareness of contributing to the preservation of water sources.</i>
		426	<i>That image conveys peace.</i>
		426	<i>Strength.</i>
		428	<i>I like jogging in nature. So, it conveys pleasure to be able to speed on the park's trails.</i>
		428	<i>Peace.</i>
		428	<i>The image conveys tranquility, but only when there are not so many people in this place.</i>
		432	<i>I have the willingness to thank nature for being here having this experience.</i>
		432	<i>The image makes me feel the power of nature.</i>
		432	<i>For me, the image means making a dream come true.</i>
		444	<i>The image conveys peace.</i>
		451	<i>Peace and nature.</i>
		451	<i>Love.</i>
		451	<i>Beauty and peace.</i>
		457	<i>For me, the image represents the overcoming of a challenge (long and tiring walk).</i>
		490	<i>It's great to feel like you are in nature's womb.</i>
		490	<i>It is a very reassuring feeling.</i>
		490	<i>I am exhausted at this point. The worst part of the trail requires a stop to rest. So, the image conveys a time to rest.</i>

		501	<i>Unity.</i>
		501	<i>Happiness.</i>
		501	<i>Love and happiness.</i>
		529	<i>It conveys the group's unity and peace.</i>
		529	<i>It conveys beauty and peace.</i>
		534	<i>Peace and tranquility.</i>
		534	<i>Knowledge and peace.</i>
		552	<i>The image conveys the tranquility, peace, and contact with nature that this place provides.</i>
		552	<i>Calmness and peace.</i>
		552	<i>Adventure.</i>
		556	<i>The image conveys wellbeing.</i>
		556	<i>The image conveys the simplicity of nature. I am here enjoying simplicity.</i>
		591	<i>The image conveys to me a goal successfully accomplished.</i>
		599	<i>Challenge.</i>
		623	<i>This photo conveys a lot of joy to me.</i>
		623	<i>This photo conveys tranquility.</i>
		623	<i>The image conveys a feeling of overcoming a challenge.</i>
		623	<i>Harmony.</i>
		626	<i>Peace and tranquility due to the beauty of the place</i>
		626	<i>Happiness and feelings of defiance.</i>
		626	<i>Peace, and tranquility.</i>
		645	<i>Calmness.</i>
		650	<i>The image conveys tranquility.</i>
		650	<i>In the picture, I see the interaction between man and nature.</i>
		650	<i>Peace.</i>
		672	<i>This photo conveys tranquility and beauty.</i>
		672	<i>The image conveys overcoming of challenges.</i>
		672	<i>The image conveys the calmness and peacefulness we find in nature.</i>
		672	<i>This image conveys peace, tranquility, and a sense of calmness for being in contact with nature.</i>
		678	<i>Peace and harmony.</i>
		678	<i>The photo of this orchid reminds me of birth and life.</i>
		678	<i>Inner peace, rebirth, hope, God...</i>
		687	<i>The image conveys peace; the whole place conveys peace.</i>
		687	<i>The image conveys beauty and shows how small we are compared to the world.</i>
		40113	<i>I feel like a sand grain; I think of my whole existence.</i>

	40113	<i>The image conveys freedom to be and act, respect for everything that exists, love for others. Life!</i>
	40113	<i>It conveys the joy of being in a fantastic place with my son.</i>
	40113	<i>It conveys great beauty.</i>
	40113	<i>This photo conveys peace, freedom.</i>
	40131	<i>Anxiety for the landscapes to come on the trail.</i>
	40131	<i>I feel the power of nature, which is capable of unimaginable things! I've never felt such a strong wind!</i>
	40131	<i>The feeling of relief at having passed the point of the trail called the elevator, and the spirit of companionship between my group and me. I feel ready for more adventures with them!</i>
	40146	<i>Feeling welcome by the shelter's staff and other hikers in our moment of rest after long walks.</i>
D	455	<i>Peace.</i>
	455	<i>Freedom!</i>
	455	<i>The image conveys the joy of living!</i>
	455	<i>Tranquility...</i>
	557	<i>The image of the forest and the blue sky contrasting with the green transmits calm.</i>
	600	<i>Being part of a group is good!</i>
	40112	<i>Tranquility and harmony</i>
	40117	<i>The image conveys peace and communion with the group and the mountain.</i>
	40117	<i>Unity</i>
	40148	<i>It conveys to me a feeling of being alive.</i>
	40148	<i>It conveys the importance of having grit and strength.</i>
	40148	<i>A feeling of overcoming challenges and satisfaction.</i>
	40148	<i>It makes me want to sit around discussing the park's geological formations all day long.</i>
	40149	<i>The image conveys an idea of achievement and satisfaction for the climbing and gratitude for being here.</i>
N	366	<i>It conveys peace for being here in nature.</i>
	366	<i>Serenity.</i>
	366	<i>Calmness.</i>
	369	<i>Respect for nature.</i>
	369	<i>The image conveys joy for having climbed up the mountain.</i>
	400	<i>Peace and serenity.</i>
	400	<i>Respect for nature.</i>
	400	<i>The importance of caring for mother nature.</i>

		427	<i>It conveys overcoming a challenge and personal satisfaction for having reached the summit of the Fish Head.</i>
		427	<i>Peace.</i>
		622	<i>Peace.</i>
		40069	<i>Serenity.</i>
		40084	<i>Peace and immensity.</i>
		40084	<i>Peace.</i>
3) What do you like most about the place you are now?	I	363	<i>The wind.</i>
		363	<i>The possibility of seeing wildlife, especially coatis.</i>
		363	<i>The water.</i>
		378	<i>Contact with nature.</i>
		412	<i>I like to feel the peace that this place conveys to me.</i>
		412	<i>I like the sound of the water that flows in a nearby stream.</i>
		412	<i>I like the silence and the good smell the forest has.</i>
		412	<i>I like the sound of the water.</i>
		426	<i>I like to be integrated with nature.</i>
		426	<i>What strikes me is the preserved nature's beauty.</i>
		426	<i>I like being able to photograph such a beautiful place.</i>
		428	<i>I like I can see from the lookout point the countryside houses of the city.</i>
		428	<i>I like the view of the Finger of God, which is covered by clouds today.</i>
		428	<i>The leaves of the trees on the ground.</i>
		428	<i>I like to admire the park's mountain range.</i>
		432	<i>The beauty of all these green shades.</i>
		432	<i>I like the peace I feel in this place.</i>
		432	<i>To feel the power of nature.</i>
		432	<i>I'm in shelter 4. I like the friendly environment and the sense of accomplishment for having arrived here.</i>
		444	<i>The contact with nature.</i>
		444	<i>The landscape.</i>
		451	<i>The scenery.</i>
		451	<i>The landscape.</i>
		451	<i>Crystal clear water bath.</i>
		451	<i>The water.</i>
		457	<i>The stunning views.</i>

		457	<i>The vegetation.</i>
		457	<i>The sun and crystal-clear water.</i>
		457	<i>The landscape.</i>
		459	<i>The cozy atmosphere at the Pousada inside the park.</i>
		459	<i>A cool place to rest.</i>
		459	<i>I like the airy, spacious place, which is ideal for a stop.</i>
		459	<i>Place of trekkers' gathering and fellowship.</i>
		490	<i>I like being able to look at the trees closely and from different angles.</i>
		490	<i>I like the colors and sound of water.</i>
		490	<i>The step that served as a stool for me to rest on the trail.</i>
		490	<i>The incredible landscape and the impressive size of the rocks!</i>
		501	<i>The vegetation and the view</i>
		501	<i>I like the tranquility of this environment.</i>
		501	<i>I like everything I am experiencing.</i>
		501	<i>The vegetation enchants me.</i>
		529	<i>The tranquility and peace I feel in this place.</i>
		529	<i>I love the landscape and the tranquility it conveys.</i>
		534	<i>Expectation and friendship - the moment of resting and feeding before starting the hike on the Pedra do Sino trail.</i>
		534	<i>I like to be here exploring the President's cave.</i>
		534	<i>I like the landscape and the tranquility it conveys.</i>
		534	<i>The landscape.</i>
		552	<i>I like the sound of the waterfall, the birds singing, the trees' beauty, and nature's smell.</i>
		552	<i>I like to sit, relax, read a book, talk, and rest.</i>
		552	<i>I like the landscape.</i>
		552	<i>I like the view, the sound of the water and the contact with the rocks.</i>
		556	<i>I like the peaceful place and to feel in harmony with nature; those aspects work to elevate my soul.</i>
		556	<i>I like to be able to satisfy my senses in this healthy environment, with the soft sunshine shining between the trees and the sound of birds and water.</i>
		556	<i>I like to be here because I feel reenergized and at peace in this environment.</i>
		591	<i>I like the natural pool (which is currently disabled).</i>
		591	<i>We finished hiking the trail. It is time to rest.</i>
		599	<i>I like the landscape. I can see the Verruga do Frade rock in the place I am now and the city of Teresópolis in the background.</i>
		599	<i>I like the view and the company of friends.</i>

		599	<i>The landscape.</i>
		623	<i>I like to listen to the birds singing.</i>
		623	<i>The landscape.</i>
		623	<i>The weather is fantastic.</i>
		623	<i>I like the sounds of nature, of the wind, the birds, and the water.</i>
		623	<i>I like to see coatis running free, without being threatened by visitors.</i>
		623	<i>The weather.</i>
		626	<i>I like the tranquility I feel in the park, the easy access to it, and the contact with nature.</i>
		626	<i>I like the stillness and the sound of the waterfall.</i>
		626	<i>It is delightful to be on a trail with more dense vegetation on both sides.</i>
		626	<i>I like the integration of modern construction (bridge) with nature.</i>
		645	<i>The sound of the water is relaxing.</i>
		645	<i>I like the sounds of nature.</i>
		645	<i>I did not like the scene I have just witnessed (coatis eating garbage from a trash can).</i>
		645	<i>I really like the green.</i>
		650	<i>Life is wonderful!</i>
		650	<i>I like the views of several locations from the park and several natural points within the park.</i>
		650	<i>I like the way the forest surrounds the Suspended Trail. We really feel inside the dense forest, being part of that environment.</i>
		650	<i>The landscape.</i>
		672	<i>I like the view of Teresópolis.</i>
		672	<i>I like the freshness of nature and the shade of the trees.</i>
		672	<i>I like the view and the peace at the lookout point.</i>
		672	<i>I like the scenery and the breeze.</i>
		678	<i>I like being at peace and harmony with nature.</i>
		678	<i>Tranquility.</i>
		678	<i>I like the sounds of nature on the trail to Pedra do Sino.</i>
		678	<i>I like to be connected with nature, its beauty, its sounds, its colors.</i>
		687	<i>I love being surrounded by the forest.</i>
		687	<i>Everything, I love everything in the park.</i>
		687	<i>I love being close to nature.</i>
		687	<i>I'm at the camping site. I like the convenience of having hot water.</i>
		40063	<i>The sounds of the birds.</i>
		40063	<i>I like the sound of the waterfall, which never stops!</i>
		40063	<i>Being here is an unimaginable refreshment.</i>

		40063	<i>I like that I am getting close to the Açú shelter.</i>
		40113	<i>I like to feel the fullness of nature.</i>
		40113	<i>I like to feel the senses; being in nature sharpens the senses.</i>
		40113	<i>I like to feel the wind in my body.</i>
		40113	<i>I liked the broad view. I loved the Vêu de Noiva waterfall, the smell of nature, the water temperature. Wonderful!</i>
		40113	<i>I like to get into the water and relax in this very peaceful place.</i>
		40113	<i>I like the privacy of this place and being reserved.</i>
		40114	<i>All the views to the mountains.</i>
		40114	<i>The landscape.</i>
		40131	<i>I like that this moment is just the beginning of the journey! But it already reveals fantastic visuals!</i>
		40131	<i>I like the cold wind, the feeling of finally finding a plateau after a long climb.</i>
		40131	<i>The feeling of peace and tranquility.</i>
		40131	<i>The view of the Garrafão.</i>
		40146	<i>I like the natural beauty and the challenge of getting to this point of the trail.</i>
		40146	<i>I like nature's beauty and being with friends enjoying the sunset.</i>
		40146	<i>I like the imposing mountain views and the strong wind.</i>
		40146	<i>I like all the comfort that the shelter provides us during the crossing: protection against the cold, possibility of bathing, cooking, etc.</i>
	D	455	<i>I like the sound of running water.</i>
		455	<i>The landscape.</i>
		455	<i>Peace.</i>
		455	<i>The silence.</i>
		557	<i>Nature as a whole.</i>
		557	<i>Vegetation diversity.</i>
		557	<i>I like to have a broad view of the mountains from the Borandá viewpoint.</i>
		557	<i>Tranquility on the Postcard Trail.</i>
		600	<i>The freshness and silence.</i>
		600	<i>I love having a sense of fullness while in nature.</i>
		600	<i>Both the wind and the calmness of nature.</i>
		40066	<i>I like to look at the unique rock formations in the park.</i>
		40066	<i>The grandeur of nature.</i>
		40066	<i>I like the feeling of being at the highest point of the mountain and realizing how small we are in the face of nature.</i>

		40066	<i>I love the breadth of the landscape surrounding the Papudo Ridge.</i>
		40083	<i>I am at the park's gate, and this point means the beginning of adventures.</i>
		40112	<i>The landscape.</i>
		40112	<i>Feel the wind.</i>
		40117	<i>What I like most is being able to disconnect from the urban routine and be in contact with nature.</i>
		40117	<i>What I think is fantastic is the magnitude of Pedra do Sino and Garrafão.</i>
		40117	<i>It was the first mountain that I climbed, and that made me passionate about the region. Since then, I have never stopped being in contact with this type of environment, and today, I am incredibly pleased to be able to guide people through these places.</i>
		40117	<i>The Vale do Jacó view.</i>
		40148	<i>The tranquility and beauty of nature.</i>
		40148	<i>The amazing weather.</i>
		40148	<i>What I like the most is the distance I feel from everyday problems.</i>
		40148	<i>I like the atmosphere of adventure.</i>
		40149	<i>The wonderful landscape.</i>
		40149	<i>I like the cozy atmosphere, despite the wind.</i>
		40149	<i>I like the silence, the pleasant weather, and the view to Garrafão.</i>
	N	366	<i>The landscape and quietness.</i>
		366	<i>The art of contemplating.</i>
		366	<i>The shape of the tree trunk.</i>
		366	<i>I like the path of the Suspended Trail in the forest.</i>
		369	<i>I like the peace of being in nature.</i>
		369	<i>I liked seeing a snake, a forest dweller.</i>
		369	<i>I liked the feeling of overcoming a challenge; I mean, I have managed to get to the lookout point of the 360 Trail.</i>
		369	<i>I like to see the mountains' height from the 360 Trail's lookout point.</i>
		400	<i>The vibe transmitted by nature.</i>
		400	<i>The sound of the water.</i>
		400	<i>I have good feelings when I am in nature.</i>
		427	<i>I like to have contact with nature.</i>
		427	<i>I have a sense of freedom when I am in nature. This is what I like the most.</i>
		427	<i>The landscape.</i>
		454	<i>What I like most is the easy access to the park and the good organization.</i>
		454	<i>I think it's good that the level of difficulty of the trail is low, as it gives opportunity to all visitors.</i>

		454	<i>The perspective of overcoming a challenge.</i>
		454	<i>The landscape.</i>
		622	<i>I was a little disappointed that the Suspended Trail was closed.</i>
		622	<i>I found the environment surrounding the natural pool cozy, even with the pool being disabled.</i>
		40069	<i>Water, and tranquility.</i>
		40069	<i>I like this landscape, which shows an unlikely point of view in everyday life.</i>
		40069	<i>Silence, calmness, beauty, close to the shelter (laughs).</i>
		40069	<i>The view and the proximity of the end of the crossing.</i>
		40084	<i>I like the natural landscapes and to feel nature's immensity.</i>
		40084	<i>I am in Açu Castles and what I like most is the feeling of tranquility.</i>
		40084	<i>The contact with nature.</i>
		40091	<i>Peace and tranquility.</i>
		40091	<i>It conveys tranquility and proximity with the infinite.</i>
		40091	<i>The altitude I managed to climb shows me that with persistence, everything is possible.</i>

APPENDIX 5: PHONE INTERVIEW DATA TABLE (the highlighted texts were the original quotes used to support the emerged themes and subthemes in the qualitative data analysis section).

QUESTION	VISITOR'S PSEUDONYM/WRISTBAND NUMBER	DATA
<p>1. Based on the preliminary data analysis, we have noticed that Parnaso's visitors are already very nature connected and have a keen sense of belonging to nature. It seems that the experience in the park didn't make that much of a difference in that relationship. What do you think about that?</p>	Peter/212	<p><i>"In my case, there was already a connection with nature. I grew up in Teresópolis, very close to the park, and I used to go there with my friends to enjoy the waterfalls. When I was 18, I moved to Cabo Frio, which is a city by the sea. Teresópolis is a city by the mountains, and Cabo Frio is a beach town. They are different environments when it comes to wildlife and the forest. In Teresópolis, I can feel the green, the forest, much more than here in Cabo Frio. When I visited the park, I felt a sense of nostalgia for that environment, for my childhood, the green, the Atlantic Forest, the wildlife. And that feeling... it was like I was meeting my expectations, and that gave me the support I expected and reinforced my nature connection."</i></p>
	Lyla/342	<p><i>"I think that each experience reaffirms my connection. For example, every time I go to the park, I feel good in that environment and, therefore, I pay attention, and I can notice the changes that happen there, the changes in the park's natural environment. Besides, I already have a strong connection with nature. Just now, while I'm talking to you, I'm in a Petrópolis park sitting on a sarong on the grass and looking at the sky. I always do things like that. I feel very close to nature and whenever I can I visit parks. I love being in nature, and since I was a child, I played outdoor with soil, plants, etc. After I grew up, I thought, oh, this is what I want. So, I started hiking, and I try to visit parks. I always try to be involved. For all the places I go, I try to visit parks first. I am always curious to know about the place, the wildlife, and if the protected area is well conserved. Since I grew up and started going out alone, I feel like doing that."</i></p>
	Sandra/343	<p><i>"I try to live close to nature and have a more natural lifestyle. I feel excellent in the park, it is the type of trip I like to do, but I always look for being close to nature in my day-to-day life. It is something I feel not only in the park. I do not know how to explain it. The green area of the city of Teresópolis is very preserved, within the city and around. The local culture is one of preservation. For example, instead of building walls around houses, people have hedges, grassy areas, trees in the yard. So, after I came to live here, I became more connected to nature."</i></p>
	Rita/344	<p><i>"I think that for most people who frequently go to Parnaso, the experience ends up not improving their connection with nature that much because they are already used to that environment. Their connection may improve, but not that much. And if a person does not like [being in nature] but ends up visiting a park anyway, I don't think the experience will</i></p>

		<p>stimulate a connection. I've already taken for a hike friends who don't like being in natural environments; I mean, I am not sure they don't like it, but they are not used to going, and they said they would not do it again. So, I think the experience in those places may improve the connection, but it depends a lot on the person. It's 50% - 50%. In my case, I think I ended up getting the taste for being in nature when I went through the unique experiences; I mean, even if I visited the same place, things have never happened the same way. That day when I went to the park, the sky was amazing, so different. Anyway, I think I was born this way because I always felt connected to nature. I really like animals and being in the bush. I don't like the beach so much. But when I am in the bush, I feel very comforted. I feel very much as a part of that environment.”</p>
	Francis/352	<p>“I think just the opposite. When I visited Parnaso and found it in excellent condition, it made me even more connected to nature. I already felt connected to nature before, but I think the experience was perfect for me in that sense. I have visited some national parks abroad, and I had no idea that we had one national park right here so well maintained and conserved. I felt terrific, and it connected me to nature even more. I am sure that each new experience strengthens that connection.”</p>
	Mike/353	<p>“I think that being in a park as Parnaso generates a kind of wellbeing that brings people closer to nature. Then the connection should increase.”</p>
	Paul/357	<p>“I think the visit has a significant influence on how people connect with nature. At least for me, it works like that.”</p>
	Mary/413	<p>“This trip to the park made a big difference in my nature connection because it was the first experience of my life in a park. I am different from the people I observed, who were well prepared, who already have all the equipment and rhythm. It was the first time I went into the bush. So, for me, in the beginning, I was a little bit afraid because there was only a forest on both sides; there was nowhere to run. I followed that trail, and then I had that feeling, where am I going if something bad happens? We went there to hike the trail in the afternoon, and it was getting cold, and there was almost no one else on the course; it was just my boyfriend and me, so I was scared at first. But then, as I followed the trail, I found some signs explaining the forest. That was really cool. My boyfriend was reading the information on the signs, which I had not even notice before, and I kept observing the changes in the forest and found that super interesting. Yeah, I learned a lot. In one of the signs, the message told me that I would hear birds singing, and suddenly I did hear the song. Cool! So, I thought, guys, there are birds right here! For me, it was all very new and interesting. At the beginning of the hike, where there is a waterfall, I was a little scared of that waterfall because we always hear about accidents with water bumps, so I was a bit afraid. But there was a gentleman there, contemplating nature in a very peaceful way,</p>

		<i>enjoying the sun a lot. Then I watched him and thought, how can someone be so calm and without fear. And then when we were returning, we heard a noise. My boyfriend ran ahead to check and left me alone. Three coatis were picking up the garbage in the trash can. And it made me very sad because they were not supposed to be doing it in that environment.”</i>
	Robert/426	<i>“In my case, the experience at Parnaso didn’t make much of a difference in my connection with nature because I was very adapted to that park. The less the person is used to the natural environment, the more the experience will make a difference in their life. With my relationship that is already positive with nature ... I was born in Teresópolis, I have had contact with the beautiful nature there for a long time, so it is already quite common for me. I knew everything about the hike and how long it would take from one point to another, so it didn’t make much of a difference for me. However, I learned some new things from a couple I met there, who were biologists. I saw some animals that I didn’t see before, and these were the new aspects of the experience for me.”</i>
	Renato/442	<i>“Look, in my opinion, what I experienced in the park was very special. We started observing nature differently because we saw things there that attracted our attention. Even leaves and flowers... Things we don't see in the city.”</i>
	Dorothy/451	<i>“I think that each visit to a park works to reaffirm the connection because usually the person who goes to a park already likes this type of place, this type of environment, nature, waterfalls, water. So, I think the visit serves to reaffirm this contact with nature, this taste for the natural environment.”</i>
	John/454	<i>“I think that people who visit a park already have their opinion formed concerning their relationship with nature. I mean, the person who chooses to enjoy a park in his leisure time already has some connection with nature. It may even be that the visit slightly improves the connection. But those who go to parks and, especially, agree on answering questionnaires, I think they already have a predisposition to enjoy nature, so the connection should not change that much.”</i>
	Vera/455	<i>“Oh yes, for me, being connected with nature has to do with leisure experiences in natural areas. Especially for people who do not practice sports, who do not hike, who have their life focused on more urban, less peaceful places, who love to be in a mall, so the leisure experiences in natural areas are all about, they stimulate connection. I am not a person very attached to nature, but when I have the opportunity to be in nature, I always take advantage of these opportunities and go to a park and take a walk. I’ve hiked several trails in Copacabana, Morro da Urca, Copacabana Fort. So, I usually do this, although it’s not my day-to-day life. I don’t go hiking every weekend, but if I get the chance, I’ll go and like it.”</i>

Sarah/474	<p><i>“Certainly. In my case, I think the experience affects my nature connectedness because when I leave natural areas, I feel renewed. I live in Arraial do Cabo, where we hike some trails too. Unfortunately, we see how people treat the city, dirt the trails, and those things are no good. Every time I go to a place like Parnaso, I come back a better person, more aware that I have to care for nature because otherwise, it won't be there for long.”</i></p>
Nelson/556	<p><i>“I think that whenever we go to a natural area, no matter how much we are used to going, there is a connection, a stronger connection. We leave an urban place to go to a forest place, and certainly, the visit strengthens the connection and makes it stronger. However, I don't think visitors felt connected to nature because they were already nature connected before going to the park. They felt connected precisely because they were inside the park.”</i></p>
Kathia/557	<p><i>“So, I think it would be important for you to include a question about the person's occupation in your research. For example, because I am a biologist, my perspective is a little different. The natural environment is my normal workplace, and I am used to it; I am really interested in nature. So, the experience does not influence my nature connection or how I see and act in this environment. But I believe that for a larger, more lay audience, the experience does make a difference.”</i></p>
Ryan/ 561	<p><i>“Yes, the experience makes me more aware; the experience makes me reflect. Teresópolis is a city located in the middle of the Atlantic Forest. Even so, there are not only green areas in the city. There are deforested areas, garbage scattered, etc. So, it's good to go to the park, which is a conserved area. It is not every day that you have the time or willingness to go to the park or hike a trail in the park. But being in the park makes me feel good. I like to be there. It makes me want to go more times.”</i></p>
Nick/564	<p><i>“Yes, the experience does influence the nature connection because people want a new experience when they go to the park.”</i></p>
Thais/566	<p><i>“The experience in the park connected me more with nature. I cried because I was too emotional while hiking the trail, which I found very beautiful, fantastic. Look, I came home and already invited some friends; we are scheduling, and I will take a group of friends to the park. I don't even have words to describe how I felt there. My friends also like this kind of activity very much. I am encouraging people to visit parks. I talked to some people in Parnaso and even to several first- time visitors. We stopped hiking for a while to chat. It was an indescribable experience.”</i></p>
Samantha/686	<p><i>“I think that the experience reinforces the connection with nature. Those who are willing to do at least those longer trails already have a greater connection. I think that the experience reinforces this connection that the person already has, like a process of feeding back that feeling.”</i></p>

	Teresa/687	<i>"I believe that it is always good to have experiences in nature, which always work to increase nature connection."</i>
	Tim/40122	<i>"I think the experience influences a lot because it is when you participate actively, and you feel you belong to the natural environment. You feel surrendered to nature when you have a sense of belonging and feel like part of that environment. So, I think it's weird that there is not so much variation in your research scores because you have to integrate when you are in the natural environment. I believe that the outdoor experience is super important in this relationship because it is when you are interacting with the environment. Hence, it's impossible not to feel part of that if you're actively participating."</i>
	Elza/40142	<i>"In my case, I already had this solid connection with nature. I usually do outdoor activities, at least once a month, so I think I already have a relationship with nature, you know? I think it was because of my connection that I had a very high score in your research. But the experience helps improve my nature connectedness because going to national parks is something I have done since I was a child. So, my connection has been improving throughout my life."</i>
	Tom/40146	<i>"Well, from my point of view and also from the people who were with me that day, I agree. There was not much change in my connection scores because when I went to Parnaso, I already had that feeling of belonging and connection to nature. Some people who were with us on the trail seemed not to have a connection with nature and even said that it would take time to do another activity of that kind. I think they did like to hike that trail, but it was a very challenging hike, which may have hindered the strengthening of their connection with nature. In my case, I have always lived in rural areas. I was born in Tocantins, in a small town. There was always a natural place to go near us, so I grew up nurturing this connection with nature. Later, when I was older, I got married. My wife works for ICMBio. So, nature is always present. She is delighted to work for the Institute, so I end up participating. I was already used to visiting parks, but after I got married, I started visiting more often to know the protected areas with which she interacts and knows people. She works at the ICMBio headquarters in Brasília, and we have developed a strong interest in knowing the protected areas. In the past, we focused on waterfalls, etc., close to home, but now we are very focused on getting to know protected areas."</i>
	Lourdes/40147	<i>"Look, I felt already connected to nature before going to the park, but indeed the visit was a way to strengthen that connection and even face my fears and overcome them. I am afraid of heights, and I had to face this fear all the time in the park."</i>
2. Do you think that experiences	Peter/212	<i>"Yes, I think so. In my case, I think I was influenced by the fact that I grew up in that region, in Teresópolis. I went to Itatiaia National Park, which is located in the Atlantic Forest, but</i>

<p>in natural areas, such as the last one you had in Parnaso, can stimulate or improve your connection to nature? If so, in what ways?</p>		<i>in a different environment. Visiting those areas raised my curiosity and, as I matured, I realized how important it is to preserve nature."</i>
	Lyla/342	<i>"Well, in the case of Parnaso, the park is stunning, and the fact that it is very well conserved and maintained caught my attention. It made me feel more nature connected."</i>
	Sandra/343	<i>"No, I do not think it has to do with trips to natural areas such as parks. I have learned to connect with nature, especially from the moment I came to live in this city, and this feeling has become more intense due to the influence of the local culture."</i>
	Rita/344	<i>"Yes, I think the connection can always improve a little. It depends on the person. But the person has to have the characteristic of enjoying being in nature and immersed in that environment."</i>
	Francis/352	<i>"Look, the first park I visited was not even in Brazil. It happened in Chile.... Torres del Paine. I was very impressed with that place. I didn't go to Chile to visit that park, but as I was already there, I decided to visit it and really liked it. I think it's more related to that. I feel very close to nature, and I feel great, both physically and psychologically. It's a good time for me when I am in nature. I currently live in Angra dos Reis, close to the beach, and my house is surrounded by nature. The place is very green. I've lived here for four years, and I think that this fact made me pay more attention. Moving to Angra has facilitated my access to nature, and then I started a closer connection and wanted to visit other parks. Since I moved here, I started hiking more trails and going out to enjoy other natural places. So, the fact that I moved here generated more connection and more desire to visit other sites of this type."</i>
	Mike/353	<i>"Yes, no doubts about that. To know the place, to learn about the place, and the sense of feeling good when seeing waterfalls, the preserved forest. It is really cool."</i>
	Paul/357	<i>"For me, contact with nature is super important. So, when I went to Teresópolis for the first time, I planned a kind of itinerary, and the first place I chose to visit was Parnaso. The visit greatly influenced how I connect with nature, because I felt like being closer to nature. I took my kids, so they also had the opportunity to get closer to nature. So, I influenced them directly in that part, and in the future, they may be taking their children to visit the park. My wife likes it too. So, after we got married, it was even easier to make this kind of trip. I have been visiting natural areas for a long time. I know some parks. However, I don't have much time or financial condition, but I like to be in nature, so whenever I can, I visit parks and hike trails."</i>
	Mary/413	<i>"Yes. The park experience brought me closer to nature and made me want to return to the place. I am a very urban person. I like to go to the mall. If I go somewhere, I want to know if there is a mall near there. But in Teresópolis, something different happened. I went to the</i>

		<i>park because my boyfriend wanted to go there. When I saw that I had to go for a walk, I said, hey guys, I'm not physically prepared for that; I am an inactive person. Then he said that we were going to hike the shortest trail. It was all very new. For example, when we went to Gramado, we entered a park, but there was no dense vegetation, conserved as in Parnaso; so that experience was totally different."</i>
	Robert/426	<i>"When the person comes from a big city and visits a beautiful place like a national park, that visit works like a watershed in his life. The person starts understanding the natural environment because then he starts breathing better, his hearing becomes better, so all those things impact that person. He starts feeling the positive effects of being in nature. In my particular case, each experience reaffirms and increases my connection with nature."</i>
	Renato/442	<i>"What happened to my colleagues and me was that, after visiting the national park, the visit aroused our desire to visit other natural areas. We are already planning to hire a guide to hike the Petrópolis-Teresópolis trail. We are also planning to get to know other trails because it sparked our interest in knowing more about nature. It is not just about walking but observing all the beautiful things we do not see daily."</i>
	Dorothy/451	<i>"In my case, I started to enjoy this kind of trip because I used to travel with my family. Some people don't like it because of the insects. Taking trips, getting to know new places, then you will like nature more and more. I like to go to natural areas; I like the trails, the beach, fresh air. I live in a beach area, and I love to live there."</i>
	John/454	<i>"Over time, the connection may increase as a result of that kind of trip. But in my case, I think I developed a relationship with nature because of my childhood when I lived in a small city. We don't usually do this type of tour, we don't usually travel a lot, due to lack of time. That was the first time my wife and I went on that kind of trip; It was my first trip as an adult to a park."</i>
	Vera/455	<i>"Ah yes, I believe so, because you are in a place that is pure nature. When you enter those trails, you have the impression that you are out of reality, in the middle of the forest. I told my daughter that I would not hike one of the longest trails because I felt a kind of fear, feeling more isolated. But anyway, I found the trail very interesting. I think I was already connected, even though I was not used to going to parks and everything. I found the experience exciting and really liked the conservation of the trail, the cleanliness of the places where I went. I found the park well conserved, despite having some places that need maintenance."</i>
	Sarah/474	<i>"I am very connected with God. And how could I not be connected with nature, considering that I am so connected with God? I like being in nature; I love nature very much. I think we have to be nature connected and not harm it because if we do it, we are harming God, and</i>

		<i>we will get that back. If you don't do your part, nature will return to you in the form of a seaquake or other environmental tragedies.”</i>
	Nelson/556	<i>“Well, in my case, experiences in natural areas influence my connection with nature. There is a nature reserve near my house that I used to visit: the Grajaú Reserve. I used to go there frequently. Then I realized how much these visits influenced my perception of the environment. One day I went there, and everything was beautiful, everything was cool. The other day, I went there again and found a cookie package on the floor. That called my attention. Of course, I took it, even if I was not the one who had thrown it there. I thought, wow, maybe the person who threw the trash doesn't have that perception. I started taking notice of how different people are. And with that, I have expanded my consciousness slowly and gradually, and then I became a better person. I was not going to natural areas only to observe; I was already connected and protecting. I was already interacting to keep that environment conserved.”</i>
	Kathia/557	<i>I think so. As I told you, I believe that for a lay audience, the experience does make a difference. But if the experience doesn't stimulate the connection, at least it encourages people to respect nature.</i>
	Ryan/561	<i>“I don't think I'm as connected to nature as I should be. Because of the rush, we don't think about it so much. But I like it, I want to appreciate nature's details, but I do not need to be in the park to do that. I like to appreciate a flower, the animals, the details of everyday life. I was raised in the bush. My mother loves to take pictures of the sky, the colors of the sky and clouds. We love to stay in the garden watching birds, a toucan. My grandfather also liked to observe and analyze the landscape. So, we created the habit of this daily interaction, not necessarily because of the park. That made me respect the environment; my mother always taught me. I am critical of throwing trash on the street. Now I am a teacher, and I try to pass on to my students the respect for nature because it interferes directly in our life.”</i>
	Nick/564	<i>“I like visiting parks. I have visited a lot of them. My first visit to a park was to Tijuca National Park in Rio. I really enjoyed the experience, and after that, I started visiting other parks. I mean, the air, the wind, everything is different inside a park and stimulates a greater connection with nature.”</i>
	Thais/566	<i>“Contact with nature was a crucial factor in rescuing me from the darkness. My friends started talking, wow, Anne, you only want to go to the bush! All the invitations I make are to go to the park, let's go to the park. Let's go hiking there, see nature. I do not invite anyone to go to a club anymore. I just want to be in nature. Guys, you have no idea of the beauty, the beautiful things inside the park.”</i>

	Samantha/686	<i>“Certainly, I’ve always been to parks since I was a kid; I grew up in a place close to nature. I think that influenced my connection.”</i>
	Teresa/687	<i>“I live in Guapimirim. In that city, there are many waterfalls and natural areas. I grew up in these environments. So, my connection with nature has always been part of my life. I believe that getting in the habit of visiting these areas helped me to maintain the relationship.”</i>
	Tim/40122	<i>“I think that each experience strengthens connection because after each day you spend on the mountain, you are more and more concerned with the conservation of the place. I am more and more concerned with the type of visitors who have been to the park, which gives me a greater sense of how I really need to raise awareness along the way.”</i>
	Elza/40142	<i>“The last experience at Parnaso helped, too. And I want to continue to get closer to nature because I know that having several and different experiences will increase my connection. For example, I live in São Paulo, and whenever I come back from those trips to natural areas, I start to question my way of life, where I am living, the distance I am from those natural places. Because when I am there, I am very connected to nature. Then, I usually come back to the city, questioning those things. When I was a kid, I hiked many day hikes with my parents because they liked nature. When I grew older, last year or the year before, I did my first camping on a long-distance trail in the middle of nowhere, and I connected a lot. I like being a little distant and disconnected from the rest of the people you are used to seeing every day. It is a kind of detachment from day-to-day life that helps you feel many things about nature that you don’t normally feel in a city like São Paulo. When I was a child, I liked to go hiking with my parents, and when I got older, I started to go further, one more step each time. I like to stay in very close contact with nature. The thing I like most is camping and spending the night in the woods.”</i>
	Tom/40146	<i>“I think that each new experience strengthens connection. However, I noticed something different happened to my group. While we enjoyed the views, people suffered to overcome the obstacles on the trail and said they would never do that kind of activity again. These people were unable to pay attention to the environment and connect to nature. Instead of enjoying the trip, they were worried about the next move.”</i>
	Lourdes/40147	<i>“I think that the experience increases the connection because, in fact, the person who visits these areas always wants to come back. If you don’t practice life outdoors and don’t visit these areas, you will get a little rusty and disconnected. So, each time the person goes to these natural areas, he wants to go back to the same area or other areas like Parnaso.”</i>
3. What aspects of the	Peter/212	<i>“To be in nature ... this has a lot to do with where I grew up, where I lived. So, I want to continue visiting these areas to keep this feeling alive.”</i>

recreational experience in nature do you consider most important to influence your connection to nature?	Lyla/342	<i>"Ah, visiting parks help maintain a connection with nature. I would say that I visit parks because I feel safer in those areas than in other natural areas. The security aspect counts a lot. I am lying alone here on the grass, which has to do with the fact that I feel like I'm not taking any chances. Safety is critical in parks, together with the staff who care about the area and keep the trails fully operating."</i>
	Sandra/343	<i>"I believe that [my connection to nature] is the result of the influence of the local culture. I mean, the fact that I am living in Teresópolis helped me with that."</i>
	Rita/344	<i>"The park is much more preserved and maintained than a natural area located outside a park. For example, it is completely different to be in Parnaso than to go to a place like Caledonia, where there is graffiti all over the place, besides being badly maintained. It is not the same experience. The park is much more preserved. Besides, as I visit these areas, I learn something different. A plant, a bird that I have never seen before. So, each time I go, the connection improves a little bit."</i>
	Francis/352	<i>"I think [the aspect I considered most important was] the park's general state of conservation. I found the park very well maintained. Nature there is very well preserved; the paths are well signposted. Everything is clean, and the structure to support visitation is very good."</i>
	Mike/353	<i>"The peace I feel ... being in such an environment conveys peace and tranquility to me. It is like cleaning the soul and the thoughts in my head."</i>
	Paul/357	<i>"What I really liked was the trail, but to hike the trail was a bit complicated for my wife. I liked to hike the trail, but it was not a good day for her. And then we couldn't do the entire track. We went up more than half the way, and she couldn't take it anymore. I was anxious and curious to get to the end of the trail, the arrival point, the expected landscape. The park's staff gave us a folder explaining the track, so we already knew more or less what it was like. I liked the trail, the structure for visitation, and if I can, I will go back there."</i>
	Mary/413	<i>"The signs directed my view and my perspective for what was happening in that environment. I am not in the habit of reading the messages on the signs, but my boyfriend was reading aloud, and that sparked my interest. And if I hadn't read the signs, I wouldn't have seen nature the way it was there. I would already have another, less profound perception concerning deforestation in the middle of the trail; I would possibly pass straight on, and I would not have noticed the forest phases' differences. I would think it was all the same, a unique look because to me, that was all bush. We saw the difference in vegetation and the singing of birds because of the signs, so it was amazing."</i>
	Robert/426	<i>"I am very used to visiting Parnaso. However, I saw some animals and some fungi I haven't seen before in that park. Those were the new aspects of that experience for me. Then I realized that Parnaso is more conserved than before. I noticed a difference in park</i>

		<i>preservation, and that made me happy. So, for me, the important aspect is to find nature well preserved. A place where I can take some fresh water from a river, feel the wind differently, where I can see wildlife.”</i>
	Renato/442	<i>“When I was a child, I lived half an hour away from the last bus stop. So, since I was a child, I have contact with nature, with wildlife. Where I live today, near my house, there is a park, Recanto da Tartaruga. So, since I was little, I live with that, with nature. But the experience at Pedra do Sino was different from anything I've ever lived. I saw things that I don't see where I live - for example, the park's organization. Another thing that caught my attention was that the vegetation at the beginning of the trail had an identification, a small sign on some of them that taught us what they were. That caught my attention. For a lot of people who go there, those trees are all bush. The signs gave us a notion of what was what in the forest. I fell in love with that.”</i>
	Dorothy/451	<i>“When I go to parks, I enjoy doing everything it is available to do. I don't like just taking pictures. Taking pictures is cool, but I think it's very little when you're in a place like that. You have to take advantage of the place. I went to Parnaso on a cold day, and even so, I decided to swim in the Dois Irmãos well. Wow, the water was freezing, and only I got into the water. I wanted to get into the water because ... I don't know. I think that if I had not swum or connected to nature in that way, body and soul, it would be as if I hadn't gone. It wouldn't be the same trip. I think you have to enjoy everything. I felt like hiking the trails all day long, but I had only a few hours to enjoy the park, so it didn't happen.”</i>
	John/454	<i>“Look, I think the park is very well maintained and nature well conserved. For those who visit the park for the first time, as it was my case, there is an enjoyable environment.”</i>
	Vera/455	<i>“Look, as I told you, the trails are the aspect that catches my attention. Hiking on the trails. Oh yes. In those moments when I didn't see any urban areas. For example, from the lookout point, at one of the stops, you have a wonderful view of Teresópolis, which was what I liked the most. But I felt more connected with nature the moments I was surrounded by vegetation.”</i>
	Sarah/474	<i>“Ah, the trees, the wildlife, the coatis that were there at the entrance gate. I was in love with them. Seeing them was my first experience. Then we went up and could feel the peace that that wonderful nature transmits to us. It was so cool!”</i>
	Nelson/556	<i>“For a visit to a park to be more impacting, the park should do an introduction... there should be an introduction depending on the number of times the visitor has been in the area. I mean, the park should provide a video and ask visitors to watch it, to help and stimulate people to learn about the park and connect with nature. A welcome video. A very didactic video of 5 to 10 minutes explaining the park's importance, what to expect from the visit, what is expected of the person, what people can and cannot do within the area, and</i>

		<i>the leisure options. Thus, I think there is a chance of transforming people since not everyone has a keen perception of the environment. People are sometimes very disconnected; each one has its problems. The park could try to touch people since they are already there and probably opened to learn about the natural environment. It would be interesting to take this opportunity to wake people up. I think that's it. Many people get there and are narrow-minded about the natural environment; others are more aware of the environment. There is always a difference between people when it comes to environmental awareness. I think that watching a video before starting the visit can be an attempt to standardize environmental awareness."</i>
	Kathia/557	<i>"It is easier for people to connect with the environment if they interact with it. For example, at the zoo, people interact with animals; for a person who is not used to it, the interaction is cool. For most people, the animal draws more attention. It's easy to see that. But the green, the bush is not so attractive, it's not so attractive because people don't interact with it. It is necessary to provide some extra information for the person to better appropriate that environment. Information stimulates people to understand a plant's characteristics and if it serves as a shelter for some animal, or a curiosity about a tree and a leaf. I think that this information makes the person more interested and connected to the environment."</i>
	Ryan/561	<i>"I think the trails are the most interesting aspect. I saw a coati too. It was really cool. It's nice to be able to interact with the coati. I had never come so close to a coati. I also like to enter the waterfall."</i>
	Nick/564	<i>"Contemplation helps the person to connect with nature. I was contemplating the Finger of God from the viewpoint on the Postcard trail. Also, when I'm at the park, I don't think about my problems."</i>
	Thais/566	<i>"I would say that the visit to the park contributed to my wellbeing. I saw life in everything. Nature is life."</i>
	Samantha/686	<i>"The fact that the park is still very wild. I met very few people on the way when I was hiking the trail. There were many people in the shelter and the camping site but only a few people on the trail. In this way, that context gives you greater freedom to feel, to interact with nature more playfully."</i>
	Teresa/687	<i>"My grandmother raised me. She is very connected to nature and loves the bush, so much that there was a small forest in our house. Today the forest is huge, bigger than the house. My grandmother worked as the Secretary of Agriculture. She has always taught us, from an early age, the importance of nature in life."</i>
	Tim/40122	<i>"Concerning my customers, I have got great feedback from them. The company gives us access to the emails they write. Sometimes in a testimonial on a social network, they write about the experience of being in the park and the difficulties they faced to hike the trail."</i>

		<i>They also write about how that experience made them feel small and see the natural environment as unique and glorious. They usually write about the great pleasure of being in nature, contemplating the stunning Serra dos Órgãos, and reaching the end of the trail very tired, but going home with that sense of accomplishment. These are more or less the feedback I have got from most customers."</i>
	Elza/40142	<i>"Well, I would like to have the freedom to stay longer in the park and go where I wanted when I wanted. In my case, longer trips to natural areas, like hiking for several days, help increase the connection."</i>
	Tom/40146	<i>"Solitude and conservation."</i>
	Lourdes/40147	<i>"I think that experiences like the one I had in the park strengthen the connection, yes. One reason is that when I am in the park, there is an immersion in that environment. We go there, feel cold, dive into the cold water, wake up to see the sunrise, sleep after watching the sunset. We are at the mercy of nature. So, for sure, the experience in nature strengthens my connection."</i>
4. What aspects of the recreational experience in nature do you consider most important to influence belongingness?	Peter/212	<i>"Although I have visited the park many times, I have always expected to get back to know more about this region, my region, where I grew up. So, I got to know new trails over the years. The last time I went to the park, many people talked about a trail that I had not heard about before. Then I thought: I am from the region, and I had not felt that sense of belonging because I had never been to that part of the park. People were talking about the Postcard Trail. Then I went there, I hiked that trail, and I reached my goal. There are other trails that I intend to do and have this sense of belonging."</i>
	Lyla/342	<i>"Wow, I do not know how to explain. I think the most important aspects are the landscape, seeing the wildlife running free and safe, I mean, that feeling of freedom... I can't explain. Freedom is something that makes me feel good in the natural environment. But not only my freedom; the freedom of wildlife."</i>
	Sandra/343	<i>"I believe that local culture influences me a lot. Moreover, one important aspect to me during my experience in an area like Parnaso is silence. I like silent places."</i>
	Rita/344	<i>"The vegetation, the sky, which counts for me a lot. I'm very connected to the universe, so for me, seeing the sky the way you don't see it in the city because of the lighting really, really counts. I managed to hike all the trails in the lower part of Parnaso. I hiked them all. The landscape ... if you hike the trails, you see that most of them face the Finger of God. Going up and seeing that landscape that most people don't see is very rewarding for me. I think it's my soul that feels comforted. And my body too. It's a little bit of both. We went camping in the lower part of Parnaso. I didn't take a sleeping bag, so I almost died of cold. I was awake all night, and yet the next day, I got up well. So, regardless of whether it was an uncomfortable night, I woke up extremely ready for everything."</i>

Francis/352	<i>"It is not easy to describe. I confess I am a very inactive person, but hey, I hiked three different trails that day when I entered the park. In places like Parnaso, I am willing to walk, reach a goal, reach the end of the trail because the environment makes me feel well and capable of doing that activity."</i>
Mike/353	<i>"In my case, contact with nature is therapy. The contact with nature brings me tranquility, peace. It's like a therapy day. I calm down and free myself from material problems. I consider it therapy, a nice day when you forget everything that is bothering you. I know all the parks in Rio. I didn't know this one, Serra dos Órgãos. I went there with my daughter for only one day; it was cloudy, but I loved it anyway."</i>
Paul/357	<i>"When I'm in that kind of environment, it's kind of therapy for me. I totally escape the routine, the noise, the stress of everyday life. I feel very comfortable. The visit works like a purge; it cleanses my body. I come back home more inspired, lighter, much cleaner. How am I going to explain? Much purer."</i>
Mary/413	<i>"I think it was the fact that I started paying attention to the forest details because of the [interpretive] signs."</i>
Robert/426	<i>"The experience as a whole. An important aspect is to find nature well preserved. A place where I can take fresh water from a river, feel the wind differently, where I can see wildlife."</i>
Renato/442	<i>"Maybe...safety and organization, which enable us to enjoy nature. Yesterday my wife was talking about Pedra do Sino with a friend. We were encouraging her to go there because she wanted to, but she was afraid, and we were showing her that the trail is safe, there is no way to get lost. The pathway is obvious, and there are always many people walking in the same direction. I am in love with that park"</i>
Dorothy/451	<i>"I really like the water. I think the water brings us great pleasure when you are swimming, diving, looking at the fish, the wildlife. When on the trail, you see the monkeys, the birds. And this is all very cool. You realize you are in a world with many different species. I live in a rural area, and we still see many birds; we see many things that those who live in the city do not see. It's perfect."</i>
John/454	<i>"I believe that the visit will increasingly bring a greater sense of peace and comfort, which greatly benefits a person's wellbeing. But I think this feeling happens for those who are already looking for it. I think that anyone who does not have this connection will hardly enter the park willingly."</i>
Vera/455	<i>"Ah, yes, yes, the silence, the peace, the green, all of these make a different moment, a moment of peace, no matter how urban the person is. It conveys silence, peace, the real contact with nature."</i>

Sarah/474	<i>“Every time I go to a place like Parnaso, I feel more comfortable in that environment, more peaceful, harmonized; I think there is nothing better than that. It is a pity that there are people who do not see this.”</i>
Nelson/556	<i>“When I was in the park, a bird was flying and making a peculiar sound, and it was nice to follow the flight and the sound it made until it landed. It was exciting. The bird caught my attention because it looked like it was talking to us. That was cool.”</i>
Kathia/557	<i>“I think the reception was good, and the park's conservation is good, except for the Suspended Trail. Conservation and welcoming staff were the two most important aspects.”</i>
Ryan/561	<i>“Well, I really like the park. Also, the park is important for my city. I like my city, so everything contributing to tourism or everything contributing to making the city stand out is good. It makes me feel good. It's like someone praising someone in your family. It's like you're praising yourself. If you're praising the park, you're praising the city. And if you are praising the city, you are also praising me because I am part of that city.”</i>
Nick/564	<i>“When I am visiting an area like Parnaso, I am immersed in the environment and do not think about my problems.”</i>
Thais/566	<i>“The contact with people, the tranquility of the people there, the birds I saw, freedom. Of course, you have to behave well and be respectful. Some people think that the fact they cannot do this or that in the park means prohibition. I do not feel this way. It is a matter of respect for nature. Besides, I learn a lot by doing this kind of activity, which leads to great discoveries.”</i>
Samantha/686	<i>“Nature has something, a kind of solitude that interests me.”</i>
Teresa/687	<i>“I think the peace that nature brings me is the reason why I feel good. I work, study, and I am usually stressed. When I go to a natural area, those stress feelings end, and it is like I start again. For example, I was very stressed before going to Parnaso, and after my experience there, I felt like I was a different person; I felt good. I feel I need to be in nature again because it is a therapy for me. In nature, there is a kind of peace that I cannot find anywhere else.”</i>
Tim/40122	<i>“As I said, when I am in a natural environment, my interaction with it is so intense that I pay attention not only to the landscape, but I follow everything along the way. When you feel part of that environment, you want to preserve it so that the environment lasts for a long time for other generations to take advantage of that space. If you see some garbage on the way, you want to take it out because you want to make fair use of that place if you feel you belong to that. That is why I think the research's evaluation is really out of reality because of what I see and what I know of being in nature. And also using as examples the participants I take to the park because I work with them. So, my way of considering that I</i>

		<i>belong is really like that, you interact, make good use of the place, and preserve it in the best possible way.”</i>
	Elza/40142	<i>“I think that sense of belonging increases if I let go of some ... mainly habits and even objects that I am very dependent on. Here in São Paulo, I am always ... I don’t know... It seems that I depend on a lot of equipment, cell phone, car, bus ... I think this dependence generates an artificial life. But when you’re in a natural environment, it’s like you for yourself, and that’s fine. I think this is what I like, to feel something more intuitive. I think we are losing our instincts. You know, we depend on a lot of material tools, and we do things ... in fact, things are done for us ... I think I miss doing things. In natural places, I get in touch with my instinct. Besides, there is a kind of exchange between the environment and me, and that is what generates belonging.”</i>
	Tom/40146	<i>“I think I have a sense of wellbeing when I am in an area like Parnaso, stimulated by a disconnection from day-to-day busy life. When you are in the natural environment, you have that feeling of tranquility, of harmony. And then we stop to think that being in the natural environment is what is natural. We think that our natural environment is our day-to-day environment, but no. On the opposite, we are a little out of the house. When I am in nature, I feel better; there is a good feeling.”</i>
	Lourdes/40147	<i>“I think the beauty of the place and feel nice, comfortable. Usually, when I go to a place I already know, I feel more comfortable. When I go to an unknown place like Serra dos Órgãos, it was a little more challenging, an adventure. It was the first time that I stayed for three days in nature, so it was different. I felt much more challenged, and that was a new thing for me. It helped me to strengthen this side that I didn't even know I liked.”</i>
5. Is there anything about your experience in the park that could be improved to stimulate a connection with nature and belonging?	Peter/212	<i>“I think they could install more signs along the trails, explaining how many kilometers you have walked and how many more you need to walk. I mean, the trail’s mileage. This guidance would be important to help people assess whether they can hike the entire trail. Besides that, I think they could stimulate families to go to the park. When I was a kid, we went to the park as a family, had a picnic, etc. When I grew up, I heard complaints from my elders, my parents. They said that there was a family atmosphere in the park in the past, which was lost over time. They said picnic spots were being deactivated. It seems that restrictions on the picnic were being put on because of dirt. I think it is even coherent, but there are other ways to deal with it, for example, asking families to take their garbage away. I think they should keep picnic areas because they are an interesting thing. The park should make it clear that families are welcome. I know there are trails available, I know there are several things already, but there could be special events or something like this, to welcome families, especially those who live in the surroundings. There is no point in having tourism if there is no structure and visitors do not feel welcomed.”</i>

Lyla/342	<i>"Parnaso is wonderful. I found everything perfect. I didn't see anything that needed improvement. Everything was clean; I didn't see any trash lying around. Everything was great."</i>
Sandra/343	<i>"I think there is a lack of access to information. During most of the year, the park does not develop, for example, programs focused on teaching about the park's fauna and flora. There is no available explanation about the environment. For example, visitors were feeding groups of coatis. I think the park should provide a communication program so that people understand they cannot feed coatis. It may be a lack of resources, right? I think the park should inform visitors about the area, what is being offered there, and the diversity of flora and fauna. The visitor may be unaware of all those things. If the park had a communication program, it would encourage visitors to learn about the park. But of course, it had to be developed in an interesting way that would attract people, that would combine leisure with learning."</i>
Rita/344	<i>"No. I mean, Parnaso is a little less taken care of than Itatiaia national park, but I think it's because Parnaso is very close to the city. So, I think the park is perfect; the park's staff only need to prevent graffiti on the rocks. They could also take more students to visit the park, encourage them to take walks. Because most people don't know a park, they have never been there, as I had never been. When you visit, you start building a bond with nature, or at least to respect nature. If the person doesn't like being in the bush, at least he will respect nature. It is a type of education. Doing environmental education in schools combined with visitation would be very important."</i>
Francis/352	<i>"No. I felt really good. It was all perfect for me that day in the park."</i>
Mike/353	<i>"Maybe ... it would be nice to have a guide available, who would tell groups organized by the park about the place. It is important to know the trails' name, the name of the mountains, and why the Park exists."</i>
Paul/357	<i>"Look, if there were a cable car or something that could take people quickly to the lookout points, it would be better for older people or wheelchair users. And also.... maybe cheaper tickets to enter the park. I told some friends from work that I visited Parnaso, and two of them said that they found the ticket to enter the park expensive. At least these two families are not going to visit the park. Well, I'm not sure if they are going to visit the park, but that will have a low priority, as it doesn't fit their budget. I personally found it expensive. But on the other hand, maintaining a park with that structure, paying the employees, keeping everything clean, all of these things cost money. So, I think the government should pay more attention to that because indeed the park could have a lower or free ticket value for those who cannot afford it."</i>

Mary/413	<i>"The park was not 100% structured. There was a good, new van to carry visitors, but you could see a bit of neglect in some places."</i>
Robert/426	<i>"The last time I went to the park, I found some garbage on the park's roads. I noticed that young people were throwing garbage on the floor. I think this issue is a consequence of a lack of education. That bothers me a lot. I feel part of nature, so it bothers me a lot to see garbage on the floor. Parnaso could develop a program to sensitize people about the conservation of tourist areas, educating visitors."</i>
Renato/442	<i>"I think it will ruin the visitor's experience if any equipment is installed to facilitate the journey. The interesting thing about the trail is that the trip is very tiring for those who are not used to it. We made all the way up in 4 hours. But when you get up there, you see that it is worth all the sacrifice to see the beauty of nature. And if the park works to make the trail too easy, we will lose the value of sacrifice to reach a goal. In my opinion, they should not change anything. I think it is great the way it is."</i>
Dorothy/451	<i>"The Suspended Trail had a closed section. I think they could fix the trail. Just that."</i>
John/454	<i>"The only thing that I can think of now is that the Park should repair the Suspended Trail. We were a bit frustrated at not being able to do the full tour. But, considering all the things that the park offers, I think it's ok. Everyone who goes to the park feels welcome. I talked with the park's staff, and everyone was very polite. Well, I don't think there is much to improve, other than to keep all the attractions working properly."</i>
Vera/455	<i>"Look, I saw in the park some places that were closed for renovation. One of the trails... when I was going to hike a trail, people were coming back and saying it was closed. I am talking about the Suspended Bridge trail. The park should renovate trails and equipment for visitation during the low season when fewer visitors are in the city and the park. I went there on vacation during the high season. So, I think that renovation plans should be put into practice during the low season because during the school holidays when there are more visitors in the city and the park, the park should be fully operating. Those are my suggestions."</i>
Sarah/474	<i>"I think there should be more signs. We go through places where the forest is very dense. If you get distracted by any animal passing by and enter the bush to see it, you get lost. With this exception, the rest is all good. Visitors seemed to be well aware because I didn't see garbage thrown around; I mean, I remember finding a little bottle. Besides that, I found nothing bad. Everything was perfect."</i>
Nelson/556	<i>"I believe it would be important to spread signs with some messages, as "Do not take anything from nature but only pictures." There are already some signs in Parnaso along the way, which may awaken people who are a little disconnected. People read the messages and get their bearings. Some messages help people interact and be closer to nature. It</i>

		<i>would also be important to have staff in the field to assist, guide, and talk with visitors. I think it would be quite valid. Also, the messages on the signs could tell the person to pay attention to specific aspects, for example, wildlife in the park.”</i>
	Kathia/557	<i>“I think Parnaso should have some interactive activities for visitors. One nice example of an interactive trail is the Students’ Trail in Tijuca National Park, here in Rio de Janeiro. There are several explanatory signs along the way, explaining the species found there and which are native species or invasive species. The signs instigate children's curiosity, and it could be a tool to be used in Parnaso too. Then, there could be many more interpretive signs and people to guide visitors at certain times of the day. Also, they should fix the Suspended Trail, which has been for so long without maintenance. Safety is also an important aspect for people to develop a connection with nature. If the person is concerned about their safety, they will not visit the park or any other area. For example, in Tijuca National Park, there are many trails’ stretches where you are all alone, so you never know if you will find someone on the trail, and often the cell phone does not work. So, you are hostage of this situation.”</i>
	Ryan/561	<i>“The green areas within the cities are becoming buildings. Those who have money still have the possibility of having a garden. But those who live in communities do not. Sometimes I say things to students and realize that they don't understand because they don't have that day-to-day contact with the green, a vegetable garden, or grass to lie down. Nature is something people need. Access to those areas should be made possible for poor people through programs to encourage visitation as Parnaso does when it charges a lower ticket from local visitors. The poorest people do not have access to parks the way they should have. Often there is no interest on their part because they do not know this reality. The park's staff should provide that interaction and be a little closer to the communities so that the needy people can have access too, right? Also, what was boring me at that time in the park was that the Suspended Trail was closed halfway. It's kind of frustrating. But other than that, everything was ok. Then we hiked the Postcard Trail, and it was really cool.”</i>
	Nick/564	<i>“No. I think everything was fine.”</i>
	Thais/566	<i>“Yes, there were safety issues related to equipment maintenance, such as the Suspended Trail guardrail. In fact, the entire trail needs maintenance. If I were the administration staff, I would completely forbid passage on that trail. Because several sections need maintenance, and it is dangerous to let people walk there. This issue needs to be looked over carefully. Also, it would be nice if there were more information signs.”</i>
	Samantha/686	<i>“I cannot remember anything to be improved.”</i>
	Teresa/687	<i>“Look, the trip to the park was perfect. There is nothing to change.”</i>

	Tim/40122	<p><i>“Yes, I think that at the entrance gate, the park should ask visitors to sign a term, which could have only five topics. The topics could be: "Do not go to the bathroom less than 5 meters from a water source"; "Do not leave your garbage on the trails"; "Collect the garbage if you see any"; "Respect the individuality of visitors." Of course, it depends on each person to abide by the rules. It also depends on the education you bring from home. But I believe that at least if you get to know the basic rules concerning conservation, such as "Do not feed wildlife and do not approach animals to take a picture," it is a step forward. I do this job of informing visitors for the ecotour agency. I have been doing that in Parnaso and other natural sites as well. I always tell visitors not to touch the animals, do not leave trash on the trail, etc. And we really do the monitoring. I think that is why we have good feedback from visitors at the end of the expeditions. They also report an increase in their personal connections with nature.”</i></p>
	Elza/40142	<p><i>“I would like to have a little more freedom to spend more time in the places I want. At Parnaso, you have to make a reservation to hike the trail, which I understand perfectly since the reservation has to do with how many people can be on the trail a day, preserving the trail and everything. I wish I could stay longer! I hiked the Petrópolis - Teresópolis trail in 3 days, so there was a pattern of how much time you have to walk each day, the distance you have to walk a day to be able to hike down to the end of the trail in 3 days. I wanted to do it in more days, like staying as long as I wanted in the places I liked most and enjoying the places more. For example, I could not see any waterfall because we did not deviate from the trail path. After all, there was no time to do that. Also, I hiked some trails outside parks. I really saw garbage accumulation, so I think that one cool thing about protected areas is that there is maintenance in the sense of cleanliness. I am not talking about installing equipment like handrails, etc., but maintenance in the sense of ensuring cleanliness. In places where many people go, they end up generating garbage. So, I think one important thing is to avoid garbage in the environment in these preservation areas. I saw some garbage in a cave inside the Park. It happened on the last day when I was leaving Bell Rock. The cave is quite large; it starts in one place and ends in another. There was a lot of garbage accumulated there.”</i></p>
	Tom/40146	<p><i>“I think that if the trail I hiked was in a more isolated area... there are always a lot of people on the trail. If it was possible to have a deeper immersion in that environment, I believe the feeling of belonging might increase. Perhaps a deeper connection would happen if we were alone there, or with fewer people.”</i></p>
	Lourdes/40147	<p><i>“I found the environment divine, wonderful. Nature there is perfect. The only thing that was not so good was Abrigo do Açú. We did a bivouac there, and there was no mat. I was freezing that day.”</i></p>

6. Do you think that experiences in natural areas, such as the last one you had in Parnaso, can influence your behavior concerning the natural environment or encourage greater care for the environment in your daily life? If so, in what ways?	Peter/212	<i>"Leisure experiences in nature helped me to realize how much we pollute. Today, I have more sense of responsibility concerning garbage, which I didn't have before. I am now concerned about the amount of waste we produce. I think that our country lacks social awareness, and we are not mature on those issues."</i>
	Lyla/342	<i>"Ah, always, right? We can't live without water. So, we try to save water at home. But I cannot say whether visits to natural areas have influenced me. If so, it happened a long time ago because it has become a habit in my house."</i>
	Sandra/343	<i>"No. "I believe that when you visit a park, you keep in touch with nature. But changing attitude due to the experience in the park is not the case. "</i>
	Rita/344	<i>"I think a lot comes from education. Because it is like that, you learn not to throw trash on the floor. Minimal, basic things about being well mannered, but people don't follow the rules. So, a lot comes from the education of each person. I think that going to the park encourages healthier actions; people have to eat healthier because they will fail to go hiking if they eat hamburgers every day. People will not go to a park if they are inactive persons. People may also start drinking more juice instead of soda or become vegetarian not to harm the environment. Not everyone, but several people I hang out with have started to consume less. In my case, I am less sedentary. I don't like to go anywhere other than to the bush, to the trail. You can call me to go somewhere, but I don't want to go unless you invite me to go to the bush. I became more active; I feel lighter, better if I'm hiking a trail than if I'm at home watching television, for example. I have also drunk much less soda and eaten less meat."</i>
	Francis/352	<i>"Look, I don't think so ... I mean, not directly. When you feel good and connected with nature, your psychological acts involuntarily, almost automatically, so that you avoid wasting water and throwing garbage on the floor. I think it increases the automatism of doing things that do not harm or degrade the environment. On the other hand, for being a passive person (I do not play any sport, nothing, I like to stay home), I feel good and able to go hiking and exercise when I am in nature. I think it is a direct benefit."</i>
	Mike/353	<i>"Honestly, no. I think that one thing has nothing to do with the other. I live in the city. When I go to parks, I disconnect and enjoy that moment. But if I see someone destroying nature, it makes me angry."</i>
	Paul/357	<i>"Yes. We start making some comparisons concerning the environment. Like, that place could be like this way, the other place could be like that way... It makes us see a piece of land and want to grow something. We start comparing and trying to work to get closer to a healthy environment."</i>

Mary/413	<i>“Yes, it reinforces, right? Especially the ideas of how important conservation is in our lives, water consumption, water waste, and recycling. We also have another perception of the law that prohibits plastic straws, and we abide by that.”</i>
Robert/426	<i>“I think so. There are things that we cannot explain. I try to do everything simply. I don’t like a waste; I try to save water; I don’t use plastic bags. I try to reuse things and not throw garbage in the environment, etc. I don’t know why I do this, but I know that it helps the environment because it means less garbage thrown around. An animal will not eat that garbage. In my environment, at home, I try to reuse things, I do not use plastic bags, etc. In Brazil, we don’t have an environmental education that focuses on the place where we live. We only talk about preserving natural areas, but nobody pays attention to the general environment. I think that some things I do also change who is around me. For example, I have a niece, and I walked with her on the beach another day. She took a little popsicle from the sand and kept it in her hand until she found a trash can. She did it without anyone saying anything to her. She is a little child, and I think that because she saw us doing it, she did it too. Setting an example and influencing people to do the same is what will help the planet survive.”</i>
Renato/442	<i>“Having experiences in these areas helps to be more responsible, I think; you even start looking differently at plants at the house and start giving more importance to the green. We remember to water the plants. So, I believe that there should be a system for valuing nature, but I also believe that this must start with our children's present generation. If our government starts to raise awareness among our children, our future will be much better. I see for my son. I have an 8-year-old son, and at his school, nobody talks about nature. Nobody gives a lecture; nobody takes children to a green area to explain nature. It has to start with the future generation, and the government has to think about it now. If we lose nature, we lose everything because we are all interconnected. Nature is part of my life, and my life is part of nature. There is no way to separate.”</i>
Dorothy/451	<i>“No, visits to parks can even make people reflect a little, but not in a way that will make people recycle garbage, for example. Other things in people’s lives may stimulate behavior changes. The park could even address these issues; I don’t know exactly how. But in the park, we are very focused on the beauty of the place, enjoying it, having fun. If the person does not mind about the world, one visit to the park will not encourage new behaviors. We are always watching the news and social networks to understand how our lifestyle habits affect the environment. Because of all this information we receive every day, it is impossible to continue being so consumerist. We need to consume the world less and avoid wasting natural resources on things that are not necessary. Otherwise, we will certainly end up destroying everything we have.”</i>

John/454	<p><i>"I think so. If people arrive at the park and feel and absorb the peace in that kind of environment, they will want to have a more sustainable life. How to maintain healthy environments like that one if we don't do our part, right? But I don't know if this sensation lasts for a long time due to the human being's profile. While we are delighted with an outdoor experience, we usually try to do things right. But the human being tends to forget and make the mistakes of the past again. Going back to the park will always motivate the person to change, and maybe it will become a permanent habit if the person keeps visiting places like Parnaso."</i></p>
Vera/455	<p><i>"Oh, yes, yes, for sure. People may change habits of throwing garbage on the floor as they experience preserved, clean, well-maintained environments. Brazil should invest in keeping Parnaso and other parks in full operation. That would encourage people to have more contact with nature and, consequently, environmental awareness. In short, I could see that Parnaso is well conserved and clean. I believe this is important and encourages visitors to be more aware, especially those who do not act that way in their daily lives. I think good examples can influence people's behavior."</i></p>
Sarah/474	<p><i>"Yes, of course. Certainly, it is a consequence of being in nature. It' has nothing to do with media, nothing. Our environmental consciousness has to do with what we do. Once in a while, we hike a trail, and we see that things have to change. We know that we have to save water, or we will run out of it. We know that we have to save energy, we have to recycle. The problem is that we usually don't do what we should, do we? The way out is to educate. For everything in life, there must be education. You see people sweeping sand off the sidewalk with water. But the government has to show its face, show that he is together with the people. You walk around with the garbage in the bag because there are no bins, and if there are bins, they are full. The government needs to show its face. There has to be investment and communication to make people understand."</i></p>
Nelson/556	<p><i>"I do not know if visiting a conservation unit can influence the care for the environment. I guess It is more of a matter of environmental awareness. I think that visits to natural areas would not be enough to influence daily care for the environment, in addition to a greater responsibility to care, to care for what others do not care for. On the other hand, if there is a previous awareness process in a visitor's mind, the visit is super valid because this way people have more strength to start working for conservation, even if on a small scale, instead of delegating all the responsibility to the State, the government. The important thing is to take action."</i></p>

Kathia/557	<i>"I do not think so. I think that the experience does not strongly change people's willingness to act with environmental awareness daily. In my case, I don't know; I already have this awareness, regardless of visiting a park. I have a different view. But on the other hand, if a person feels touched by being in a protected area...you know...touched by the stunning nature, he may have a greater incentive concerning conservation and the use of natural resources. I think the experience may influence behavior, but I don't know if it directly impacts people in their daily lives."</i>
Ryan/561	<i>"I haven't noticed it yet. Some environmental behaviors we do, they have to do with family habits. The visit to the park makes me feel physically okay, but it does not cause significant changes in my day-to-day life."</i>
Nick/564	<i>"No, I don't think so."</i>
Thais/566	<i>"Yes, I have changed several habits. Things that I used to do and didn't know it was wrong. I think the issue is our education system. So, I have started to learn from visitors in the park and the park's rules. I have started to develop another way of thinking. For example, I had a habit of bringing home small things from nature, such as a little plant, an orchid. I learned not to do that and respect nature."</i>
Samantha/686	<i>"I think that outdoor experiences in natural areas like Parnaso gave me a new perspective on conservation. Currently, I believe we have not many preserved areas, and we need more of them. Besides, I feel like engaging in the sense of having environmental responsibility and trying to pollute less, generating less waste. We need to do something about this waste issue."</i>
687	<i>"Yes, for sure, visiting natural areas helps. You see the beautiful park, and you want your city to be green and beautiful too. That is not happening, unfortunately. Also, I take care of my food. I try to look for natural food, which is better than industrial food. If you start to eat healthier, you start to feel better."</i>
Tim/40122	<i>"Yes, yes. I avoid excessive consumption, and here at home and work, we separate the garbage for recycling. I don't usually buy clothes or shoes, but only if I need to, and I teach my children that way. For food consumption, we try to ingest the amount of food that we need to stay well. Throughout the day, we eat moderately to have good health and not end up throwing food away."</i>
Elza/40142	<i>"Yes, I think the experiences in nature influences environmental behavior. A nice thing that happens on these trips is that you end up meeting people who generally tend to be more careful with the environment. I exchanged information about natural products and things you can do to pollute the environment less. In general, I save water, these things I already do. On trips like that one in Parnaso, we realize that there is a land that we are living in and have to value it, you know? We are so welcome, and we keep throwing things on the</i>

		<i>floor. So, in that sense, I believe that the influence of these experiences in nature is that you start taking care of the environment you live in.”</i>
	Tom/40146	<i>“Certainly, the visit helps...but the influence on behavior is also related to environmental observation, such as climate change, I guess. Contact with nature makes us want to improve the conservation of the environment. I had an experience of cleaning the beach in the Lençóis Maranhenses National Park, as I told you before, and because of that we are thinking about reducing our trash, like stop using plastic, straws, etc. I had read a lot about it before going to Lençóis Maranhenses, but in the park, we saw that the tide’s trash on the beach is very serious; 70% of waste is plastic, a dire situation.”</i>
	Lourdes/40147	<i>“The visit to such areas like Parnaso positively influences a lot... I think that the more we see that things can be more natural, that we carry as little as possible in our backpack, we start making comparisons with our own lives. Every time I pack the gear, and every time I have to buy something, I think, do I really need it? For these hikes, you take what is necessary. Yes, wow, the other day I went to pack a suitcase and thought, wow do I need so much? And then, I started throwing things out of the bag.”</i>
7. Do you think that experiences in natural areas, such as the last one you had in Parnaso, can influence your behavior concerning the support for parks, reserves, and other protected areas? If so, in what ways? What could you do to support parks and other protected areas?	Peter/212	<i>“Yes, the visits help reinforce the idea of conserving these environments. Parnaso is very important due to several ecological factors, and we ignore it. I believe that the park will be preserved because it is a protected area. I want the park preserved because I want to take my son there to have the same opportunities and experiences. I matured, and maturing generates reflection and such. I think it is essential to bring more people to the conservation side, to be more aware of the importance of conservation, because we depend a lot on society to succeed, right?”</i>
	Lyla/342	<i>“I have never thought about that, but I would volunteer for a park if I had the time.”</i>
	Sandra/343	<i>“Yes, I believe so. I would support these areas' conservation and encourage the implementation of green areas in the urban environment. The wellbeing I feel when I am in nature, I miss it in the urban environment.”</i>
	Rita/344	<i>“I am willing to support protected areas. If I knew an area that needs a volunteer, I’m willing to help.”</i>
	Francis/352	<i>“I think so. From the moment you know a well-preserved place, which is well maintained and conserved, and you go to another place that is not like that, you want to make the latter better. Picking up trash or encouraging friends to visit saying, hey, the place is so cool, let’s keep it conserved.”</i>
	Mike/353	<i>“Yes, no doubt. Experiences in parks influence support for preservation.”</i>
	Paul/357	<i>“Yes, Yes. I do preserve nature. Not only mountain areas, woods, but also beaches. If we are not careful with nature, it will be a little complicated for our children, for our</i>

		<i>grandchildren. So, I think it's super important for us to protect, take care of, visit, and publicize protected areas."</i>
	Mary/413	<i>"Oh yes, I think that these areas should always be conserved because they are natural assets for everyone. We need to keep them preserved for our children. I read an article about the Amazon and the deforestation of areas the size of soccer fields. That makes me sad. Where do the animals go? Everybody loses. And why do they let that happen, to that extent?"</i>
	Robert/426	<i>"I don't think the experience has changed me in this way because I was not very involved with parks and the environment. Today, my head is in another setting. I am working in a city. The visit itself brought no change. It may still bring. However, before Pedra da Tartaruga was part of the forest reserve, I collected trash there on my initiative. I always say that these initiatives are my things; they have nothing to do with the education I had, nothing. I used to go to Pedra da Tartaruga and didn't like to see garbage thrown all around there, and then I collected it. I was 17 years old or so and was already collecting trash."</i>
	Renato/442	<i>"I think that the experience inspires us to support these areas because we start valuing them. If we don't take care of them today, what will the new generation see tomorrow? And we depend on nature to live. Unfortunately, the new generation is not paying attention to this. But when we go to the park and observe everything, we start to think broadly about nature, its importance in our lives. Nature doesn't exist just because it exists; nature exists to support us. In our self-interest or out of greed, we are the ones who end up not valuing nature as it deserves."</i>
	Dorothy/451	<i>"I think so. For example, in Parnaso, you want to throw the trash in the trash can and not dirt the place because you want to see everything clean. This feeling of taking care of the place where you live or recreate is still missing in Brazil. There are still many cities, mainly in Rio and Bahia, where people still habitually throw garbage on the ground, on the beach, in the sand. There is no perception that if you get the place dirty, you will get punished or that you will be spoiling something beautiful and harming the animals that live there."</i>
	John/454	<i>"Look, I think that, especially for those who go for the first time and for those who have never had much contact with parks, I think so, I think the person ends up giving more support and spreading the word about the park because he feels welcomed, and at peace. We want the environment ... we want to increase the number of areas of this type in our country, but to do it seems to be complicated."</i>
	Vera/455	<i>"Ah yes, knowing is different. It is one thing when you know the theory and another thing when you visit. One of these days, I watched TV and saw some news about Parnaso. A French guy was hiking the main trail and get lost in the park. Then I told my daughter, who</i>

		<i>is 12 years old, look, this is the park where we were. I also commented with the family. Anyway, it is different when you have visited a place and not only heard about it, the feeling changes.”</i>
	Sarah/474	<i>“Yes, I would support these areas, but we do what we can. The visit to Parnaso didn't change my disposition because I always liked to support natural areas. For example, we always ask tourists not to leave garbage in Arraial do Cabo, where I live. We take plastic bags to pick up trash on the beach. So, my perception didn't improve. We have to take care of the natural environment; otherwise, it will disappear.”</i>
	Nelson/556	<i>“I think so. People who visit parks can help in some way. For example, I know a protected area in Trindade, Parati. It was necessary to repair the trails by placing wooden boards to protect them, which would allow people to hike the trails, even those who do not have much mobility, such as the elderly. There is still no ramp for the wheelchair user to walk the trail and get into nature. Anyway, I know that some volunteers helped in this project.”</i>
	Kathia/557	<i>“I believe so. The visit encourages support for natural areas. For example, many people are unaware of their harm when they feed animals on the trail. They think it's just a little food and won't make a difference for the animal. They are not mean; they do that probably because they do not have the correct information to guide them. Environmental awareness makes a difference at these times. I think the visit encourages people to have more respect for nature. I think that when you see the beautiful nature in the park, that encourages you to preserve it, to have it preserved.”</i>
	Ryan/561	<i>“Ah, I would love to help. The park gives people a lot of wonderful experiences, so it's cool to take care of what is ours, of what is good for humanity.”</i>
	Nick/564	<i>“Yes, if I had the opportunity to support the parks, I would like to. But it has nothing to do with visiting parks. It is my nature because I always liked to do that.”</i>
	Thais/566	<i>“Yes, for sure. How was I supposed to think of something I didn't know yet? From the moment I started visiting the parks, I started observing, understanding things, and learning; then, I started getting the taste for and discovering nature. And I really want to contribute. And being able to say there is my effort, my dedication, I am part of it.”</i>
	Samantha/686	<i>“Yes. And one way of doing that would be visiting and paying higher entrance fees to contribute to the maintenance and preservation of that place. I have no interest in other actions, such as participating in demonstrations or dealing with politicians. I relate my perspective with an environmental awareness that I already have, which may even increase with the visit to these areas, but it is not the result of visits alone. Besides, let's value nature as an economic resource. I'm a biologist. In the past, I thought it was weird to pay a fee to</i>

		<i>enter parks; then I started to understand the reason for that because of the valuation of nature and because we need to protect it. Nowadays, I think the fee to enter the parks is very cheap. I think the question is how we value public service. People say, wow, if the parks are public, why should I have to pay to enter them? But everything has a cost, and nowadays I think visitors pay a low price to enter a protected area.”</i>
	Teresa/687	<i>“I can say that the willingness to act in favor of protected areas increases as a result of the experience. But in my case, I always have this intention. I support the parks by doing my part. I don't throw garbage in nature because I respect it a lot. But I have never participated as a volunteer or done other direct support.”</i>
	Tim/40122	<i>“Yes, of course. I am a volunteer at Tijuca National Park in Rio, and from time to time, I do some volunteer maintenance work on both the trails and monuments inside the park. I have not yet adopted any trail stretch due to lack of time, but when there are task forces to clean the trail, I usually take part. One of the trails that I take customers is Pedra do Telégrafo, Barra de Guaratiba, which is part of Transcarioca. But I have been sad when I go there because people throw bottles, garbage in the middle of the trail, and the hillside, where it is much more difficult to collect. The situation gets better when people hire a tour guide because the guide helps to raise awareness. The guide makes it clear that tourists should bring their garbage back. The last time I went there, I saw some volunteers cleaning the trail, and they were also calling the attention of a collective so that people pick up their trash and take it away.”</i>
	Elza/40142	<i>“Yes. For example, after I participated in your research in the park, I started to follow the Instituto Chico Mendes's website to find a possible way to help and be a volunteer.”</i>
	Tom/40146	<i>“Indeed, when a person is connected to nature, he starts noticing or paying more attention to what is happening in that environment. When I repeat the visit to a place and see that it is degrading, I think I should be more concerned and help take care of this specific place... However, I am not so used to taking concrete actions to support parks. Recently, I participated in a cleaning day at one of the beaches at Lençóis Maranhenses National Park. We should participate more in volunteer actions in protected areas and do more things in everyday life, like using less water and separating garbage for recycling. I mean, we should try to take care of the environment as a whole and not only parks.”</i>
	Lourdes/40147	<i>“I do not think so. The experience, even if positive, does not necessarily lead to support. For example, I do not do any work for these areas; I just go visiting them. I think that involvement depends on the window of opportunity as well. Of course, if I had a chance to help in any way, I would take the initiative. But very little is being done in this sense of preservation.”</i>