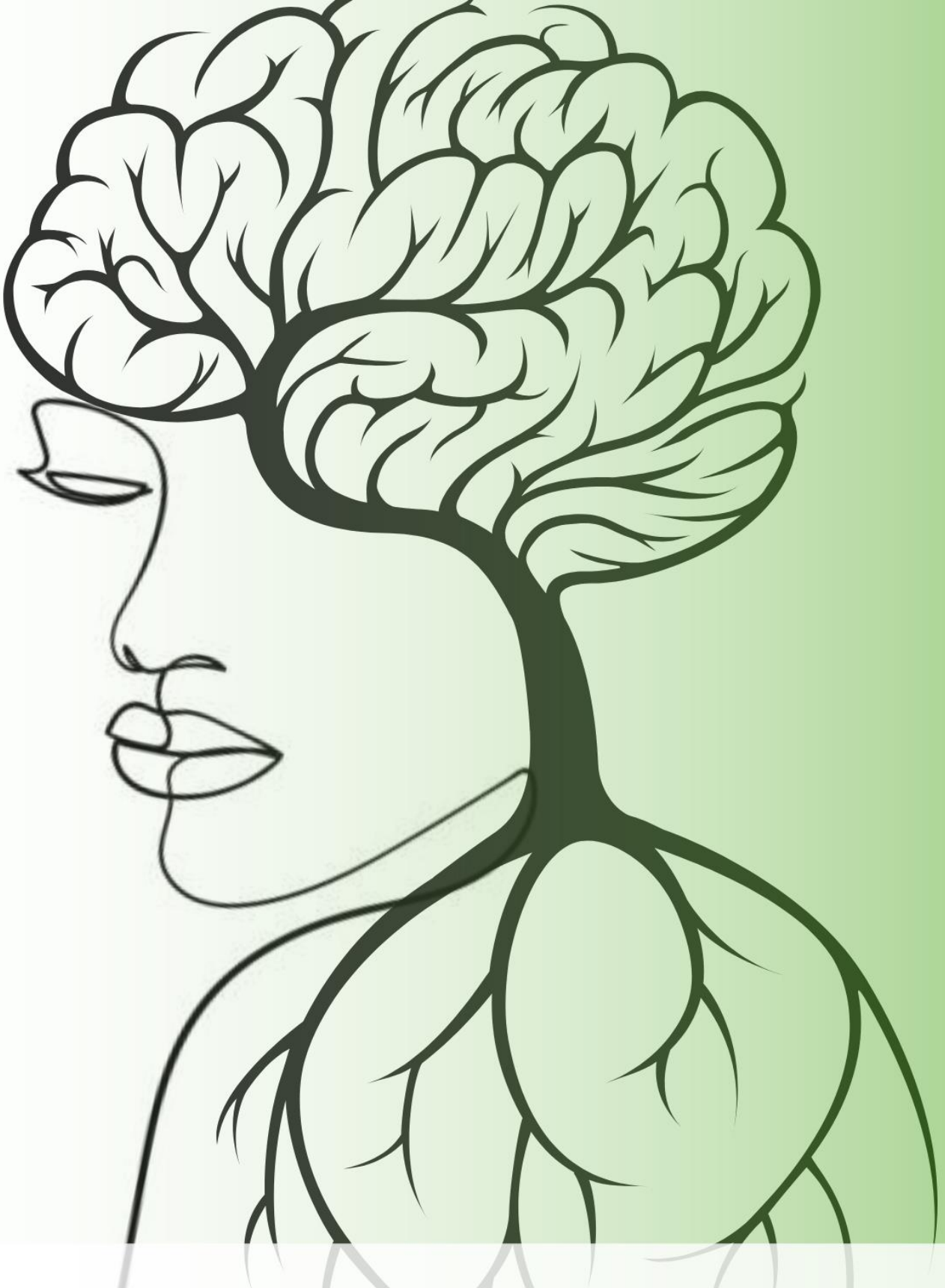

Psychological transformation through a wildlife tourism experience

A COGNITIVE HIERARCHY THEORY APPROACH TO THE HUMAN-NATURE RELATIONSHIP

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A Cognitive Hierarchy Theory approach to the human-nature relationship

A Master Thesis

by

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Abstract

Human activities are affecting the planet's climate and are inducing social and ecological disruptions. The human-nature relationship has been weakened through the development of contemporary societies. Nature-based and wildlife tourism are getting more popular by the day and currently make up a vast majority of the tourist industry. Spending time in nature and interactions with wildlife have the potential to transform people psychologically to be more environmentally friendly. Guided by the Cognitive Hierarchy Theory and the transformative tourist experience mechanism, this thesis focused on three concepts to measure human-nature relationship construct that are less abstract and that can be fit within multiple levels of specificity of the Hierarchy. Connectedness to Nature, Wildlife Conservation Intentions and Donation Intentions reflect hierarchical levels of fundamental values, attitudes and norms and behavioural intentions. A field-experiment was employed with a between-subjects design, so causal relationships could be established. As a second aim of the study, the associations between the three concepts were explored to test the Cognitive Hierarchy Theory on the principle that linear relations exist between the different levels of cognitions. The fieldwork was conducted at the Jaguar Rescue Center in Costa Rica, where 284 visitors from 27 nationalities were included in the study.

The results of the study confirmed the principles of the Cognitive Hierarchy Theory. Broad, abstract cognitions such as values are resistant to change. Neither Connectedness to Nature or Wildlife Conservation Intentions demonstrated a significant difference. Donation Intentions, being a context specific cognition and therefore increasingly prone to change, did significantly change after taking part in a wildlife tourism experience. Secondly, small positive associations between Connectedness to Nature, Wildlife Conservation Intentions and Donation Intentions were found. This corroborates with the Cognitive Hierarchy principle that levels of cognitions indeed inform each other, yet the influence they exert is limited and not exclusive. This research has demonstrated that the potential to psychologically transform the mind beyond the wildlife tourism experience exists, yet a single experience is not likely to transform the deeper cognitions that are most important in changing someone's environmental worldview. Future research could draw on these findings in other nature-based and wildlife tourism contexts. In addition, future studies should focus on repeated exposure to wildlife tourism experiences to understand if deeper cognitions would change if more frequently engaged with.

Key words: Cognitive Hierarchy Theory, wildlife tourism experience, human-nature relationship, connectedness to nature, wildlife, conservation, donation, intentions, dispositions

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Hereby I proudly present my master thesis: “Psychological transformation through a wildlife tourism experience: A Cognitive Hierarchy Theory approach to the human-nature relationship”, as part of my study programme Tourism, Society and Environment at the Wageningen University & Research. Several months of hard work and dedication but also of pleasure and personal development went into this research project. I can honestly say I am extremely proud and happy with the final result, and hope that it has provided me with a solid basis to achieve my future professional goals.

First and foremost I would like to thank the Jaguar Rescue Center for giving me the opportunity to conduct my research in Costa Rica. I hope my work will inspire the foundation to continue the amazing job they do of taking care of injured and orphaned animals. I want to thank the management for giving me this opportunity, and the tour guides and volunteers for welcoming me with open arms and making my stay in Costa Rica a time in my life that I will never forget. I also would like to thank all the visitors of the Jaguar Rescue Center that took part in this study. Without you I would not have been able to complete my research.

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Now, without any further ado, I sincerely hope you enjoy reading this thesis!

Nathalie Frissen

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List of Abbreviations

CHT= Cognitive Hierarchy Theory

JRC= Jaguar Rescue Center

PET experiences= Peak, Extraordinary and Transcendent experiences

WTE= Wildlife Tourism Experience

Statistical measurement expressions:

α= Cronbach's alpha

d= Cohen's d

df= *D*egrees of freedom

r= Pearson's r correlation coefficient

rs= Spearman's Rho correlation coefficient

M= Mean

N= Sample size

P= Probability value

Partial ñ²= Partial eta squared effect size measure

SD= Standard Deviation

SE= Standard Error

SS= Type 3 Sum of Squares

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Chapter 1: Introduction

This chapter provides an introduction for the topic at hand involving the human-nature relationship, the proposed disconnection from nature in modern societies, and how this may be influenced or altered by particular tourist experiences. Nature-based and wildlife tourism experiences are briefly introduced, as well as an understanding of how these niche markets have become increasingly popular over the past decades. Secondly, a short introduction into environmental dispositions and the Cognitive Hierarchy Theory is given to set the scope of this study. Furthermore, a problem statement is proposed including the aim and purpose of this study, to conclude with the main research question that will be the read thread throughout this thesis. Lastly, the outline of the report is presented.

1.1 Nature tourism as an environmental fix or a transformative experience?

Human-nature relationships have been an academic interest since ancient times and refer to the ways people think about, feel towards and envision relationships with more-than-human aspects of the world (Gould & Schultz, 2021). Finding its origins in migration and modernization, perspectives on the human-nature relationship have been shaped by centuries of cultural, religious and historical developments (Manfredo et al., 2020). Presently, human activities are affecting the planet's climate, while inducing disruptive societal and ecological impacts (American Geophysical Union, 2019). Increasing acknowledgements of the planetary crisis have led scholars to believe there is a disconnection between modern societies and the natural environment, which has been proposed as a fundamental cause of unsustainability (Ives et al., 2018). The demand for society to reconnect with nature is presently growing and has gained attention across multiple scholarly disciplines. Meanwhile, the dichotomous portrayal and conceptualisation of the human-nature connection in the literature, but also in media and education might in itself act as a reinforcement of the separation from nature.

The tourism industry has become one of the largest industries in the world (Lock, 2022), while tourism based on natural environments and wildlife makes up a major part of this industry and is becoming more popular by the day (Curtin, 2013; Manfredo, 2008c; UNEP, 2006). Nature-based tourism comprises all activities that feature the natural environment as the main attraction (Kuenzi & Mcneely, 2008), including niche markets such as wildlife tourism, adventure tourism and ecotourism, among others. Wildlife tourism in particular, is referred to as a type of tourism which is centred around encounters with non-domesticated animals in a captive or non-captive setting (Ballantyne et al., 2009), encompassing both consumptive activities such as hunting and fishing and non-consumptive activities such as viewing, feeding and photographing (Mutanga et al., 2017). Wildlife tourism experiences can influence the human mind beyond the experience itself (Apps et al., 2018; Ballantyne et al., 2009; Curtin, 2013), making them suitable situations for achieving psychological transformation with regards to pro-environmental thoughts and actions. In addition, aesthetic fascination with scenery and wildlife have been found to evoke peak experiences and may contribute to a sense of unity or harmony with the world at large (Kirillova et al., 2017).

In any respect, the commodification of nature marks a major transformation in the human-environment relationship (Liverman, 2004, p 734). On one hand, nature-based and wildlife tourism can be viewed as an 'environmental fix' in the attempt to justify the capitalist development of the tourism product that simultaneously contributes to ecological deterioration of the natural environment that is being commodified (Fletcher, 2019). On the other hand, these types of tourism experiences may serve as a tool to get back in touch with nature, to raise awareness and enhance knowledge on the current state of the environment and to promote eco-friendly behaviour. However, this does not imply that fundamental values or beliefs regarding the environment are easily changed, as they are deeply rooted trans-situational goals fuelled by socio-cultural determinants and corresponding environmental philosophies. Yet, as research has pointed out, tourism experiences may have transformative powers, or a profound impact on an individual's personal life (Arnould & Price, 1992; Kirillova et al., 2017; Teoh et al., 2021; Williams & Harvey, 2001b). Therefore, it is argued here that for wildlife tourism experiences to be of a transformative nature, they have to be experienced as something out of the ordinary and highly memorable that involves meaning-making, reflection and re-evaluation.

1.2 The source of human's nature deficit and the increasing interest in nature tourism experiences

So where does the expanding interest in nature-based tourism experiences come from, and is there a linkage with the proposed nature deficit in contemporary societies? A number of explanations may be attributed to the present popularity of nature-based tourism experiences. Firstly, the prominent and frequent representations of pristine landscapes and iconic animals by the travel industry at large and (social) media platforms may affect the desire to visit a place (Curtin, 2009; Trčková, 2016). Secondly, travel and home interests overlap more and more, mirroring self-development and self-identity in tourism choices (Curtin, 2013). This implies that everyday environmental interests can influence decisions for travel activities. Nature-based and wildlife tourism then serve as an 'extension of identity and interests', instead of merely a tourist experience (Curtin, 2013). Thirdly, there might be an innate, inherent need for a (re)connection with nature that is not being fulfilled in contemporary urban lifestyles (Curtin, 2013; Wilson, 1984).

These explanations relate to each other as they materialize in wealthy, contemporary and highly consumptive societies which are urbanised and therefore increasingly disconnected from nature (Curtin, 2013; Kesebir & Kesebir, 2017). Urbanization, modernization and technological innovations have contributed to this process by making people spend more time indoors (Mayer & Frantz, 2004), exchanging natural areas for built environments and the exclusion of nature in popular culture (Kesebir & Kesebir, 2017). The biggest difference with earlier societies is that contemporary societies do not directly depend on nature for the provision of their livelihoods anymore, or what Wright & Inglehart (1978) have identified as unprecedented economic affluence and the satiation of basic material needs (p 70). It was later agued that affluent societies place increasing emphasis on quality of life, environmental protection and self-expression (Inglehart & Baker, 2000), which would to a certain extent explain the present popularity of nature-based and wildlife tourism.

1.3 Changing environmental dispositions through a wildlife tourism experience

Many studies have highlighted the negative social and environmental impacts of tourism, touching upon topics such as loss of biodiversity, exploitation of local communities, and disturbance and detriment of animal habitats (Kuenzi & Mcneely, 2008). Contrastingly, positive consequences of nature-based tourism experiences may involve psychological benefits, conservation, philanthropy and pro-environmental dispositions and actions (Ballantyne, Packer, & Sutherland, 2011; Curtin, 2009, 2013; Curtin & Kragh, 2014; Hughes et al., 2011a; Smith et al., 2011). As such, many scientists believe that nature-based and wildlife tourism may serve as a tool for (re)connecting humans and nature by raising awareness of, and enhancing knowledge on human induced negative environmental impacts (Ballantyne et al., 2009; Ballantyne, Packer, & Sutherland, 2011; Curtin & Kragh, 2014; Duffus & Dearden, 1990; Hehir et al., 2022; Hughes, 2013; Smith et al., 2011; Spring, 2016). But while tourism experiences have the power to influence people's cognitions and emotions, they often do not directly translate into actual behavioural changes. This widely recognized attitude-behaviour gap is a key issue in social psychology and sustainability research (Higham et al., 2016; Juvan & Dolnicar, 2014; Tölkes, 2020), and remains apparent the results of many studies. To exemplify, a majority of visitors had the intention to increase conservation behaviour after viewing wildlife, but only 23% appeared successful (Hughes, 2013). Engagement in a reflective wildlife tourism experience was found to have a significant impact on short-term environmental learning, which appeared to be a weak predictor of long-term impact (Ballantyne, Packer, & Falk, 2011). And no correlations were found between environmental agency and ecotourism (Force et al., 2018).

To understand how a tourist experience can transform thoughts and feelings about the environment, the Cognitive Hierarchy Theory is briefly is touched upon here and is further elaborated on in chapter 2. The hierarchy supposes that different (environmental) cognitions are structured in a hierarchical manner in the brain. Cognitions are mental dispositions that we use in perceiving, remembering, thinking and understanding, which are acquired through the course of life and which exist on different levels of abstraction or specificity. In the light of wildlife tourism, it distinguishes stable but general values from more specific cognitions (e.g., attitudes, norms) that people use to evaluate wildlife in general or specific wildlife encounter situations (Jacobs et al., 2012, p 4). In addition, affective experiences can play an important role in making up human-nature relationships (Mayer & Frantz, 2004). As such, emotional dispositions may be key in addressing the desired psychological transformation. They are defined as a complex state of feeling that results in physical and psychological changes that influence thought and behaviour, and which underlie and shape other mental processes and dispositions, such as memories, motivation and perception (Jacobs et al., 2012, p 5). In this light, studying emotional dispositions in relation to mental dispositions allows for a better understanding of the interaction of the two psychological systems. While they connect to separate areas of the brain, they are in fact, intimately connected (Jacobs et al., 2012a, p. 5) and tend to interact when people deliberate (McKechnie, 1970).

The importance of the interaction of the two mental systems with regard to wildlife encounters has been highlighted in several empirical studies. A combination of emotion and interpretation in an embodied wildlife tourism experience is the foundation for a successful wildlife interpretation (Ham & Weiler, 2002) and can play a vital role in human-nature deficit. It can contribute to an increase in concern and respect for the animals encountered and the species as a whole

(Ballantyne, Packer, & Sutherland, 2011, p. 774), and may elicit feelings of wonderment, awe, and engagement. Consequently, this makes environmental problems more personal and pertinent and can facilitate lasting sensory impressions, emotional affinities, new environmental awareness and interests, and treasured memories' (Curtin & Kragh, 2014, p. 550). Another study has shown that a transformation in perspective and feelings about the human connection to nature is possible (Nisbet et al., 2009). Therefore, this thesis aims to examine the relatively unexplored relation between a wildlife tourism experience and human-nature connection in an empirical manner while searching for causal relations. The purpose of this research is to address the planetary crisis and the power of tourist experiences, as well as the scholarly proposed societal disconnect from nature by exploring the transformative psychological potential of a wildlife tourism experience as an out of the ordinary lived event. It further aims to critically examine the existing assumptions that nature tourism and wildlife encounters have a positive influence on human-nature relationships with the Cognitive Hierarchy Theory as a guideline.

In taking a socioecological psychology approach, this thesis acknowledges that the human-nature relationship construct requires an interdisciplinary and broader perspective that incorporates different interacting psychological dimensions of the human-nature relationship on various societal levels. Moreover, it allows for an investigation of how thoughts, feelings and behaviour are shaped in part through natural and social environments, and how natural and social environments are in turn shaped partly by mind and behaviour (Oishi, 2014). It also recognizes the complex nature of a social-ecological system, especially in the tourism context, and that they cannot be seen as separate, but rather as mutually constitutive and interdependent (Sánchez, 2019). The research question that will be answered in this thesis is therefore as follows:

To what extent can a wildlife tourism experience influence human-nature relationships?

To answer the research question, this thesis employed a field-experiment to empirically research the transformative psychological potential of a wildlife tourism experience with regards to the human-nature relationship. The field-experiment was conducted at a wildlife rescue center in Costa Rica, Central-America, where guided tours are offered to public visitors to educate them on environmental and wildlife conservation issues. Measuring and comparing various levels of cognitions with regards to the human-nature relationship construct in pre- and post-experience conditions aided in determining the associations between, and effects of the experience on the human psyche.

1.4 Report outline

This thesis is structured as follows. Chapter 2 is dedicated to explicating the theories and literature that demarcate the scope of this study. This chapter concludes with a conceptual framework and corresponding hypotheses that were tested in this research. Chapter 3 describes the overall methodological design, data collection methods and data analysis. Chapter 4 presents the results of the field-experiment. In chapter 5, the results are interpreted and compared to existing research. Limitations and suggestions for future research can also be found in this chapter. Finally, chapter 6 presents the conclusion where the aims and outcomes of this thesis will be summarized.

Chapter 2: Theoretical Framework & Literature Review

Wildlife tourism experiences can influence the human mind beyond the experience itself (Apps et al., 2018; Ballantyne et al., 2009; Curtin, 2013). To what extent is yet to be determined, as most existing studies remain explorative. This provides an opportunity to explore human-nature relationships in more depth to gain more insight into how wildlife encounters can contribute to the transformative potential of a tourism experience while simultaneously searching for causal relationships. In order to understand the complexity of a subjective wildlife tourism experience and its transformative psychological potential, the following section will first elaborate on some prominent experience theories and related concepts. Secondly, the mechanism of a transformative tourism experience (Kirillova et al., 2017) will be discussed, to demonstrate which aspects need to be addressed in a wildlife tourism experience to achieve psychological transformation in tourism context. Thirdly, the important role of emotions in tourist experiences and psychological transformation is highlighted. Fourthly, the Cognitive Hierarchy Theory will explained, which simultaneously gives direction to the hypotheses that will guide this research. Finally, a visual representation of the hypotheses will be shown in the shape of a conceptual model.

2.1 The power of experiences

An experience refers to the undergoing of a sensory action or activity that contributes to skill or knowledge enhancement and/or that evokes emotion. Tourism experiences thus, relate to experiences but in a tourist setting, meaning (temporal) spaces and places other than our home environment. Tourism experiences can be viewed as an 'an individual's subjective evaluation and undergoing (i.e., affective, cognitive, and behavioural) of events related to his/her tourist activities which begins before (i.e., planning and preparation), during (i.e., at the destination), and after the trip (i.e., recollection)' (Tung & Ritchie, 2011). This indicates that a tourism experience is not limited to the temporary duration of the key activity within the experience, but encompasses both pre- and post-visit psychological processes. Consequently, this implies that pre- and post visit (environmental) dispositions interact with the properties of the environment the tourism experience takes place in. Furthermore, a tourist experience can be the culmination of a given experience (Graefe & Vaske, 1987; as cited by Volo, 2009), which implies that it is the highlight or climax point of the lived event. These experiences may thus have the psychological power to transform thoughts, feelings or behaviour towards environment. Overall, two main approaches to tourist experiences stand out. The social science approach is concerned with subjective experiences, motivations, activities, interests, meanings, attitudes and the quest for authenticity (Volo, 2009). And the consumer behaviour approach is focused on customer satisfaction, quality of the experience, pre-existing knowledge and previous experience and the effects of external stimuli (Volo, 2009). This study will focus on the former approach, as it is aiming for an in-depth understanding of psychological transformation through a tourist experience.

The complex nature of a tourist experience is emphasized in the results and conclusions of multiple studies regarding definitions, identification and measurement of constituting elements, and the subjective loading of the concept itself. Early theories by Boorstin (1992) and MacCannell (1973) hold opposing views on the contemporary traveller. The former referring to the desire for, and satisfaction from mass tourism and a lack of desire for authenticity, while the latter

emphasizes the denial of desired authenticity in tourist experiences through staged settings. Both viewpoints, however, imply that modern tourism has lost its authenticity which affects the out of the ordinary experience that travellers are searching for and which is crucial in achieving transformation. In this light, Cohen's (1979) modes of experience allow for a further understanding that a tourists' travel desires are not as black and white as proposed by earlier theorists. Tourist experiences are a differentiation from daily life and one person can experience different modes ranging from superficial to profound during the same trip. Search for meaning distinguishes the mode of experience from the one that is not (Lengkeek, 2001). Drawing on this notion, it is proposed here that in order for a tourist experience to be psychologically transformative, it needs to be a unique and out of the ordinary experience which adds meaning to an otherwise 'superficial' or simply entertaining event.

Pine & Gilmore (1998) support this proposition by stating that experiences are inherently personal, existing only in the mind of an individual who has been engaged on an emotional, physical, intellectual, or even spiritual level. Hence, no two people can have the same experience, since every experience derives from the interaction between the staged event and the personal state of mind (p 99). Pine & Gilmore's (1998) widely recognized experience model demonstrates the complexity and uniqueness of a tourist experience. It further aids in understanding how people derive meaning from an experience and how they interact with the tangible and intangible elements of the places they visit (Spring, 2016, p 35). This same interaction is emphasized by Williams & Harvey (2001) in their exploratory study regarding transcendent experiences in the forest environment. A transcendent experience is a moment of ultimate subjective awareness, profound happiness, freedom and a sense of harmony with the world at large (Williams & Harvey, 2001). It is proposed that not only the perception and interpretation of the environment, influenced by human knowledge and behaviour contributes to the process of a transcendent experience, but more so that the properties of the environment the experience occurs in, are critical elements of the potential transcendence, as it constantly interacts with the human component. Properties of the environment then function as stimuli that trigger thoughts or emotions associated with memories or previous experiences. This interaction between the environment and the perception and interpretation of its properties is what affects a deep emotional experience in the end (Williams & Harvey, 2001).

2.2 Transformative tourist experience

But what makes a tourist experience truly transformative? Transformative experiences are individualized processes that involve a growth stimulating change regarding past or current practice. It requires new knowledge that contributes to critical awareness of the old and new self through conscious reflection, re-evaluation, and meaning-making (Kirillova et al., 2017). Transformative experiences are long-lasting and involve a change in personal traits rather than temporary mental states, indicating the importance of deliberation and interaction of the two mental systems (e.g. cognitive and emotional) during and after a wildlife tourism experience. In the following section, the mechanism of a transformative tourism experience is discussed in the context of nature and wildlife tourism.

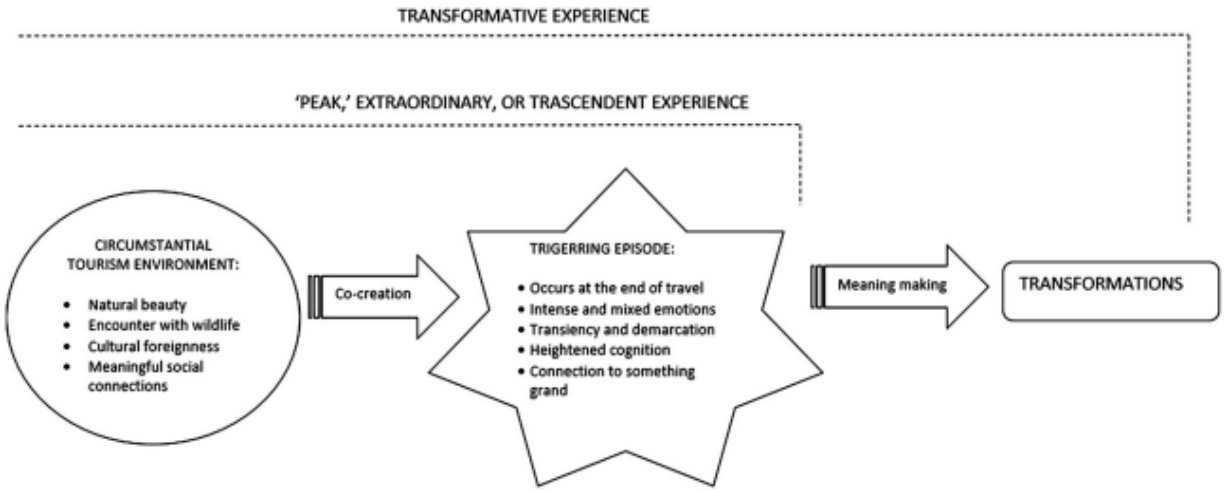

Figure 1: Mechanism of transformative tourism experience according to Kirillova et al. (2017). The circumstantial tourism environment acts as the foundation for facilitating PET experiences. The interaction between properties of the direct environment and pre-existing mental and emotional dispositions can result in a PET experience. Subsequent meaning-making through reflection and deliberation may lead to a transformative experience.

The circumstantial tourism environment is the foundation for a transformative tourism experience. Tourism experiences often take place in an unfamiliar or less familiar setting, which might be a beneficial factor in delivering a sense of novelty and spontaneity because of its liminal and liberating nature (Kirillova et al., 2017, p 4). Furthermore, aesthetic fascination with scenery and wildlife have been found to evoke peak experiences, although they are not necessarily transformative. Meaningful social connections have been found as the most important aspect of the circumstantial tourism environment (Kirillova et al., 2017). These interpersonal connections might be novel and intercultural, or with travel companions, animals or the physical environment. A wildlife tourism experience touches upon all elements of the circumstantial tourism environment, which implies that it has all the necessities to act as a strong foundation for a transformative experience.

Co-creation takes place when visitors bring their own pre-existing knowledge, perceptions and resources into the circumstantial tourism environment (Kirillova et al., 2017). These pre-dispositions then interact with the place characteristics, consisting of the landscape, social dynamics and properties of the experience as well as with the experience facilitator (e.g. guides, hosts or researchers) who shape the tourists' experience (Teoh et al., 2021). This confirms what (Williams & Harvey, 2001) stated earlier on the critical elements of a transcendent experience being the interaction between environmental and human components.

Triggering episodes go hand in hand with intense emotions of varying valence confirming theories on PET experiences (Kirillova et al., 2017). PET experiences refer here to the frequently compared concepts of Peak (Maslow, 1959), Extraordinary (Abrahams, 1986), and Transcendent (Williams & Harvey, 2001) experiences. PET experiences are antecedents of transformative experiences (Kirillova et al., 2017) and can be viewed as deep, highly memorable and emotionally laden experiences. Intense emotions do not overshadow people's abilities to cognitively attend to a triggering moment (Kirillova et al., 2017), which indicates that it does not hinder the interaction of the cognitive and emotional psychological systems. On the contrary, complementing Maslow's (1959) concept of B-cognition, the involvement of intense emotions in an experience only contributes to a heightened awareness of one's mental

processing and is therefore more able to facilitate subsequent meaning-making (Kirillova et al., 2017). This implies that the emotional triggers brought about by the wildlife tourism experience lead to emotional states that can influence an individual's thoughts and actions temporarily and that may lead to a PET experience during a triggering episode. Furthermore, a connection to a higher power such as god or the universe, and thus potentially nature as a force as well, was found to be a key characteristic of a triggering episode. A wildlife tourism experience may therefore serve as a tool to feel more connected to nature, facilitating the path to transformation.

Subsequently to achieve the desired transformation, meaning making through reflection, self-evaluation and making sense of emotional responses allows the emotional response system to interact with the cognitive system to serve as a judgement of emotional relevance and self. Meaning making is the most critical stage in the mechanism for change to occur (Mezirow, 1991). The transformative potential of an experience does not lie in the nature of its triggers but in the way these moments are interpreted and made sense of by the tourist (Kirillova et al., 2017). Furthermore, existing research suggests that people have felt compelled to change lifestyles when exposed to alternative modes of existence in culturally different context (Teoh et al., 2021, p 183). In addition, changes in worldviews and composite identity have been reported. Composite identity refers to combining new and old perspectives to broaden and deepen one's current identity (Teoh et al., 2021). This suggests that during a wildlife tourism experience people may see and experience how things can be done differently in terms of being more aware of and conscious about human impact on wildlife and the natural environment and may therefore alter their thoughts and behaviour accordingly.

2.2.1 The role of emotions in achieving transformation

Emotions are an important aspect in both tourist experiences and in achieving psychological transformation (Kirillova et al., 2017; Mezirow, 1991; Tung & Ritchie, 2011; Williams & Harvey, 2001). Yet, it remains a relatively unexplored area in psychological research. Emotions were highly neglected in the twentieth century as they were considered too difficult to study. As such, most psychological studies in the last decades have taken a cognitive approach to explaining thought and behaviour. Even though cognitions on their own only explain about 50% of the variability in actual behaviour (Jacobs et al., 2012; Teel & Manfredo, 2010; Whittaker et al., 2006). So, what can be attributed to the other half of the variance?

Several scholars have proposed that emotions play a big part in experiences with, and responses to wildlife, and they mirror basic reactions to wildlife and nature (Jacobs et al., 2012; Manfredo, 2008). Emotions, especially in the context of nature and wildlife, can evoke strong positive and negative thoughts, feelings, and actions in people (Jacobs et al., 2019). Emotions are an elemental psychological capacity that guide and form other mental processes such as memories, decision making and perception (Jacobs et al., 2012). Including emotions into research on wildlife experiences may therefore contribute to the general understanding of human-wildlife interactions, especially when they are studied in relation to cognitions (Hoberg et al., 2021; Jacobs et al., 2012; Manfredo, 2008; Whittaker et al., 2006). Because, even though cognitions and emotions connect to other parts of the human brain, they are in fact, intimately connected, and mutual feedback happens at different processing stages (Jacobs et al., 2012). Emotional dispositions are, like mental dispositions, traits that serve as criteria which judge the emotional relevance of stimuli. This means, that emotional dispositions are the fundamental inner source of temporal emotional responses (Jacobs et al., 2012). These responses

are considered mental states, and are expressed through physiological, behavioural and experiential reactions (e.g. dilated pupils, sweating, fight or flight mechanism, being nervous etc.). The difference between emotional dispositions being traits, and emotional responses being states, lies thus mainly in the temporality and depth of the emotion. Because traits, like personality characteristics, reflect who you are, and are always present, while states reflect how you are, making them temporary (Hamaker et al., 2007; Jacobs et al., 2012).

The challenge in transforming traits and behaviour through the means of a wildlife tourism experience in order to improve the human-nature relationship, lies in addressing both the cognitive and emotional system. Studies have demonstrated that wildlife tourist experiences can create a positive transformation in pro-environmental intentions through engagement and reflection (Ballantyne, Packer, & Falk, 2011; Hoberg et al., 2021; Walker & Moscardo, 2014). For instance, animal encounters can trigger an emotional response or feeling that may lead to a favourable attitude towards a particular species or nature as a whole (Hoberg et al., 2021). Subsequently, through cognitive processing, current attitudes are evaluated and challenged which may lead to new ideas and perspectives on nature and wildlife. Yet, a single experience is not likely to have a long-lasting and transformative effect, especially not on trait-like personality characteristics. However, repeated experiences with wildlife and nature may foster the desired change. While researching emotions does not fall completely within the scope of this research, it is an important aspect to highlight here, as it shapes other mental processes that we use to understand and explain human-nature and human-wildlife relationships. That being said, emotions were not directly measured in this study due to contstraints in time and resources, but mostly used to explain highly important aspects in achieving psychological transformation.

2.3 Cognitive Hierarchy Theory

Studying human thought and behaviour towards nature and wildlife is often done in relation to the Cognitive Hierarchy Theory (CHT). Derived from social psychology, the CHT is often explained in combination with the Value-Belief-Norm model (Stern et al., 1993), the Norm Activation Theory (Schwartz, 1977), and the Theory of Planned Behaviour (Ajzen, 1991) in an attempt to explain behaviour that (dis)favours nature and wildlife. The CHT dictates that an individual's behaviour is steered by a hierarchy of interrelated cognitions, including values, value orientations, attitudes and norms, and behavioural intentions (Jacobs et al., 2019).

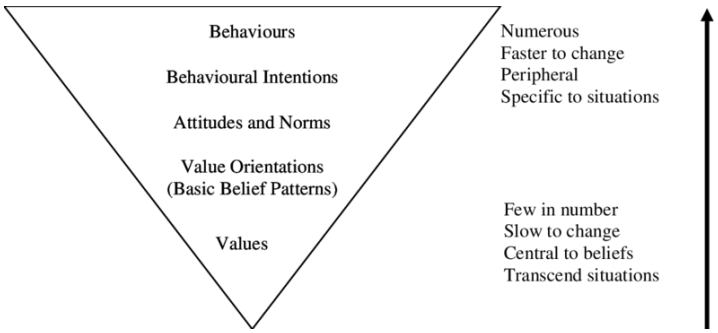

Figure 2: The Cognitive Hierarchy model: Different levels of cognitions exist on different levels of specificity, varying from context specific to transcendent across situations. Image adapted from (Vaske & Donnelly, 1999).

Values can be found at the bottom of the CHT, as they are broad intrinsic values that are mostly abstract, formed early in life, and are heavily influenced by culture and transcendent of situations. But most of all, they are part of one's identity and therefore particularly hard to change and improbable to account for much of the variance in actual behaviour.

Value orientations in turn, can be viewed as an ideology, or a set of basic beliefs that add contextual meanings to values, for instance, within the realms of nature and wildlife. They give direction and meaning to fundamental values in a certain context, and mediate the relationship between values, attitudes and norms (Manfredo et al., 2009). Imagine that someone values kindness highly, and also has certain beliefs that favour nature and wildlife. Then this person is more likely to believe that one should be kind to all living things, regardless if it may be harmful for humans (e.g. accepting return of wild animals in The Netherlands). Contrastingly, when someone has beliefs that disfavour the environment, the value of kindness will be directed mainly towards humans (e.g. rejecting the return of wild animals to protect humans). These opposing worldviews are better known as mutualism and domination . Both ideologies are heavily influenced by historical and cultural developments and are difficult and slow to change. Industrialization, materialism, immigration, technological innovation and urbanisation have influenced Global North societies to have a more dominant orientation towards nature and wildlife. While more currently, there seems to be an intergenerational shift towards mutualism values (Jacobs et al., 2019; Manfredo et al., 2009, 2020). This may be attributed to a shift from material to post-material values through wealth accumulation and the saturation of basic human needs in modern society, which leaves more room for appreciation of wildlife and connecting with nature. At the same time, younger people have been found to be more concerned with climate change issues, sometimes leading to 'eco-anxiety' or mental distress (Lawrance et al., 2022). The care for the environment in younger generations may be a pathway towards a more inclusive ideology towards nature and wildlife in the future.

Attitudes are mental states that refer to an attitude object (e.g. a person, place, entity, or idea)(Gifford & Sussman, 2012, p 1). Therefore, they are more specific to a particular situation or context than values and value orientations, and they are more frequent and more subject to change. Attitudes represent an individual's consistent tendency to respond favourably or unfavourably toward the matter in question and are informed by underlying values and value orientations. Attitudes consist of three components respectively, cognitive, conative and affective, which refer to thoughts, intentions to act, and feelings towards the attitude object. In the light of nature and wildlife, attitudes may refer to a level of environmental concern or care about wildlife conservation issues which may be transformed by an ascription of personal norms when one becomes more aware of the consequences of a particular action. Norms are internalized social norms that directly influence behaviour through feelings of guilt (Gifford & Sussman, 2012). They represent a sense of moral obligation toward taking action in a specific context, such as environmental or conservation issues. The VBN model (Stern et al., 1993), proposes that when pro-environmental attitudes and beliefs are adapted, personal norms may be activated that will cause an individual to engage in more sustainable behaviour. Personal norms and attitudes have been proven to only explain some of the variability in behaviour, but they are both strong predictors and mediators of pro-environmental behavioural intentions and behaviour (de Groot et al., 2021).

Behavioural intentions are more specific cognitions and immediate antecedents of actual behaviour. Derived from the Theory of Planned Behaviour (Ajzen, 1991), they refer to the motivational factors that directly influence particular behaviour, while being informed by underlying cognitions such as values, value orientations, attitudes and

norms. Measuring behavioural intentions can therefore be extremely useful in determining a transformation in human-nature relationships. At the same time, being motivated to perform a particular action that is pro-nature and wildlife, does not necessarily mean that the behaviour is actually triggered. This intention-behaviour gap suggests that intentions are easy to influence, but still not necessarily lead to a change in behaviour (Geiger et al., 2021). However, since behavioural intentions are a strong predictor of behaviour, it is useful to take these into account when measuring the transformative psychological potential of a wildlife tourism experience.

In conclusion, the hierarchical order of the CHT allows for an understanding of how particular cognitions exist on different levels of specificity and how these levels contribute to actual behaviour (change). These levels can be influenced by specific interventions such as a wildlife tourism experience. Meanwhile, fundamental levels of the hierarchy are trait-like characteristics, which are difficult to change, especially with a single experience. Top levels of the Cognitive Hierarchy are context specific, and more easily influenced to be transformed. To test how a wildlife tourism experience can affect dispositions towards nature and wildlife, or in other words the human-nature relationship, on a less abstract level, three measurable concepts were chosen which each reflect a different level of specificity of the CHT. In doing so, it became possible to test the principles of the hierarchy with concrete examples primarily for causality, and secondarily for correlations between the concepts that exist within the human-nature relationship construct. Meanwhile, these concepts are not exclusive in explaining the full extent of the human-nature relationship. They merely serve as more tangible concepts to explore how the CHT relates to real life situations in nature and wildlife tourism context.

The three chosen concepts are briefly mentioned here and explained in more depth in the following section of this chapter. To measure the deep trans-situational values towards nature that are part of one's identity, the concept of Connectedness to Nature was selected. Attitudes and norms were measured through the concept of Wildlife Conservation Intentions, as they reflect dispositions that (dis)favour wildlife conservation in an increasingly specific context, yet are transcendent to similar contexts. Lastly, Donation Intentions was selected to measure the most context specific hierarchy level of behavioural intentions. The intention to donate to a conservation project should be easily influenced according to the hierarchy, and will therefore be an excellent measurement of the behavioural intention level.

2.4 Measuring the human-nature relationship

2.4.1 Connectedness to Nature

Since the human-nature relationship is often referred to as a connection to nature, it is a perfect concept to measure the human-nature relationship construct in this research. Connectedness to Nature originally stems from ecopsychology and psychological research into interpersonal relationships. Connectedness to Nature conceptualisations and interpretations therefore usually involve a sense of personal identity, meaning the natural environment and experiences of belonging with nature are included in the self (Schultz, 2002; Whitburn et al., 2020) through worldviews, cognitions, emotions and behaviour (Hatty et al., 2020). Connectedness to Nature therefore, represents the level of values on the Cognitive Hierarchy as well as deep emotional trait-like dispositions.

Contrasting to the current proposed disconnect from nature, some argue that humans have an innate connection to nature. This is apparent in Wilson's (1984) biophilia hypothesis, which refers to 'love of life' in the most literal sense. Taking an evolutionary approach, Wilson claims that human's emotional connection with other organisms is a consequence of extended human evolution in a natural environment as hunters and gatherers, and later farmers. It is therefore proposed that the natural environment has shaped our emotional and cognitive apparatus in such a way that our contemporary brains, which we have inherited from our ancestors, are still attuned to extracting, processing and evaluating information from the natural environment (Gullone, 2000, p 295; Wilson, 1984, 1993). As Wilson (1993) claims: "the brain evolved in a biocentric world, not a machine regulated world. It would be therefore quite extraordinary to find that all learning rules related to that world have been erased in a few thousand years, even in the tiny minority of peoples who have existed for more than one or two generations in wholly urban environments" (p. 32). At the same time, modern societies tend to spend more time inside and in built environments as opposed to natural ones (Mayer & Frantz, 2004), which could have weakened our innate connection to nature. In addition, the decrease in dependency on nature for our livelihoods has been proposed on multiple occasions as a fundamental cause of the disconnection to nature (Curtin & Kragh, 2014; Kesebir & Kesebir, 2017). Regardless if the connection to nature in modern societies is weakened or not, both points of view indicate that Connectedness to Nature at the individual psychological level is not only influenced by people's direct environments, but even more so sociocultural values at a larger societal scale.

2.4.1.1 Connectedness to Nature as a multidimensional construct

Early approaches to the human-nature relationship were inherently cognitive, focusing on the inclusion of a cognitive representation of nature in the self (Schultz, 2001; Mayer & Franz, 2004). Yet, two recent empirical review studies have demonstrated that Connectedness to Nature should be approached as a multidimensional construct (Hatty et al., 2020; Tam, 2013), in order to get a more holistic understanding of how people may feel connected to the environment. With an expanding body of findings suggesting a correlation between Connectedness to Nature and pro-environmental behaviour (Ballantyne, Packer, & Falk, 2011; Ballantyne & Packer, 2011; Hoberg et al., 2021; Hughes et al., 2011; Mayer & Frantz, 2004; Nisbet et al., 2009; Schouten-van der Laan, 2017; Tam, 2013; Yerbury & Boyd, 2018), fostering a sense of connection with the environment, and more specifically a sense of identity with regards to nature, may be an important tool in addressing environmental challenges on an individual level.

Five interacting and mutually influencing dimensions of Connectedness to Nature represent internal and external connections, comprising material, experiential, cognitive, emotional and philosophical connections to nature which are in turn influenced by socio-cultural factors (Ives et al., 2018). With the purpose of defragmenting the current literature on Connectedness to Nature and contributing to a practical application in real-world contexts, Hatty et al., (2020) developed a new and shorter measurement instrument that strongly correlates with existing multidimensional Connectedness to Nature instruments. The CN-12 consists of three dimensions of the connection to nature comprising CN-identity, CN-experience and CN-philosophy. Table 1 provides an overview and description of the three dimensions.

Table 1: Three dimension of connectedness to nature according to Hatty et al., (2020), comprising different internal and external connections to nature (e.g. material, experiential, cognitive, emotional and philosophical connections).

Dimension/ indicator	Description
CN-Philosophy	Ideas around humanity's relationship with nature, including a sense of interconnectedness between humans and nature.
CN-Experience	Sense of enjoyment, wellbeing and belonging associated with activities undertaken in the natural environment.
CN-Identity	Cognitive, emotional, and behavioural elements, including self-perception as someone who feels emotionally connected to nature and who behaves in such a way as to protect nature.

Worldviews on the environment represent a philosophical dimension on Connectedness to Nature and are concerned with the perspective on what nature is, why it matters and how humans should interact with it (Ives et al., 2018). While the philosophical connection to nature is mostly intrinsic, it is heavily influenced by the dominant value orientation (see chapter 2.3). To exemplify, Global North cultures tend to be more individualistic, and adherent to a dominant/utilitarian orientation of nature and wildlife (Fulton et al., 1996). Here, humans are viewed as superior to other organisms, who may be used for human benefits. These people do not define themselves as a part of nature, and will therefore not have overlapping cognitive representations of self and nature. Contrastingly, Global South cultures tend to be more interdependent, and have a predominant mutualistic perspective towards the natural environment (Fulton et al., 1996). As mentioned before, composite identity may occur when one travels to another country and is made aware of how things may be done differently (Teoh et al., 2021). A wildlife tourism experience provides an environment for multicultural interaction with locals, other tourists and animals. It can bring people together as they are immediately connected by participating in the same tourism experience. Direct interaction with nature in combination with emotional engagement, meaning making and beauty are pathways towards nature connectedness (Lumber et al., 2017). And meaning-making in a transformative experience is the most critical for change to occur (Mezirow, 1991). Intercultural exchange of perspectives, knowledge and ideas may therefore contribute to broadening ones worldviews which may result in a transformation in environmental dispositions.

Experiential and material connections to nature are combined within the CN-experience dimension, representing an individual's external connection to nature. The circumstantial tourism environment (material) and the direct interactions with the natural environment (experiential) are the basic factors that may instigate a transformation in Connectedness to Nature, making a wildlife tourism experience a suitable environment for facilitating this change. Aesthetic fascination with landscape and wildlife, meaningful social connections and a sense of novelty and spontaneity are facilitators of PET experiences (Kirillova et al., 2017), which may in turn become transformative. Thus, while outer connections may not have substantial transformative power, they do facilitate a pathway towards deeper and inner dimensions of human-nature connectedness (Ives et al., 2018) and are most prone to change.

CN-Identity is an integral part of Connectedness to Nature, as it accounts for the largest proportion of variance of the CN-12 instrument (Hatty et al., 2020) and comprises the cognitive, emotional and behavioural elements of Connectedness to Nature. This interpersonal connection to nature formed the basis for earlier unidimensional approaches to Connectedness to Nature such as inclusion of nature in self (Schultz, 2002), Connectedness to Nature Scale (Mayer &

Frantz, 2004) and Nature Relatedness (Nisbet et al., 2009). The main line of thought here was that if a person views nature as an integral part of oneself, one is more prone to take care of that part, as to when it is not included in the self-perception. Addressing this dimension is therefore key in achieving transformation, as accounts for much of the variance within Connectedness to Nature. A wildlife tourism experience makes a suitable environment for influencing cognitive and emotional dimensions of Connectedness to Nature. For instance, animal encounters, or interpretation during a wildlife tourism experience that is focused on raising environmental awareness and conserving animal species often triggers an emotional response or feeling that may lead to a favourable attitude towards a particular species or nature as a whole (Hoberg et al., 2021). Subsequently, through cognitive processing, current attitudes are evaluated and challenged which may lead to new ideas and perspectives on nature and wildlife. At the same time, one's identity or fundamental values are not easily changed, as we have seen in chapter 2.3 (CHT). Therefore, it is proposed that Connectedness to Nature as a deeply-rooted value and trait will not be significantly influenced by participating in a single wildlife tourism experience. The following hypothesis was composed to measure if a wildlife tourism experience influences Connectedness to Nature:

H1: Participating in a wildlife tourism experience does not improve Connectedness to Nature.

2.4.2 Wildlife Conservation Intentions

Wildlife Conservation Intentions reflect mental dispositions that favour or disfavour wildlife conservation to a certain degree, which are found at the attitudinal or normative level in the Cognitive Hierarchy. These dispositions are increasingly situation specific, yet transcendent to other similar contexts. Wildlife tourism experiences have often been suggested as an activity that fosters conservation by strengthening environmental knowledge, attitudes and actions through interpretation and personal experiences with wildlife (Apps et al., 2018, p 108). Other scholars contradictorily suggest that wildlife tourism experiences are centred around consumption and entertainment, and that an increase in attitudes that favour wildlife conservation is unjustifiable (Hughes, 2013; Powell & Ham, 2008). In line with Kirillova et al.'s (2017) transformative tourism experience mechanism, it was proposed that in order for a wildlife tourism experience to be psychologically altering, it needs to be a highly memorable and emotionally laden experience. If a wildlife tourism experience is indeed merely an opportunity to consume and be entertained, then it will not be regarded as memorable or life-changing. On the contrary, the experience will be unconsciously lived with a limited capacity for reflection, deliberation and meaning-making. However, it is assumed here that a wildlife tourism experience does have the potential to transform attitudes in terms of wildlife and nature conservation. Especially because a wildlife tourism experience serves as an extremely suitable contextual tourism environment, which in turn is the foundation for a transformative tourist experience. Furthermore, existing research has suggested that up-close, multi-sensory experiences with animals and seeing them engaged in a variety of active species-typical behaviours, can lead to positive emotional or empathic reactions, which then lead to conservation related outcomes (Miller et al., 2020, p 2). This underlines the theoretical perspective that a contextual tourism environment such as natural beauty or an encounter with wildlife triggers an intense emotion and heightened cognition, which in turn can lead to a transformation (Kirillova et al., 2017). The VBN model (Stern et al., 1993), which is often utilized for explaining attitudes and behaviour, proposes

that when pro-environmental attitudes and beliefs are adapted, personal norms may be activated that will cause an individual to engage in more sustainable behaviour. Norms can be influenced by becoming aware of the consequences of a particular action and directly influence behaviour through feelings of guilt (Gifford, 2014). They represent a sense of moral obligation toward taking action in a specific context, such as environmental or conservation issues. Making people more aware of environmental and conservation issues through a wildlife tourism experience may therefore contribute to a change in conservation attitudes. To measure the influence of a wildlife tourism experience on Wildlife Conservation Intentions, the following hypothesis was composed:

H2: Participating in a wildlife tourism experience increases Wildlife Conservation Intentions.

2.4.3 Donation Intentions

Donation intentions reflect the CHT level of behavioural intentions, which are specific to a situation and predict a large part of the variance in actual behaviour (Sauro, 2019). Research in nature and wildlife tourism contexts proposes that behavioural intentions can be enhanced by affective engagement during the experience (Ballantyne, Packer, & Sutherland, 2011; Hughes, 2013; Kirillova et al., 2017; Mezirow, 1991; Tung & Ritchie, 2011; Williams & Harvey, 2001). Because emotions, especially in the context of nature and wildlife, can evoke strong positive and negative thoughts, feelings, and actions in people (Jacobs et al., 2019). More specifically, and as proposed earlier in this chapter, reflection, deliberation and meaning-making subsequent to a wildlife tourism experience facilitate the pathway towards psychological transformation and have been found to correlate significantly with the formation of positive behavioural intentions regarding wildlife conservation (Hughes, 2013). So, if people are stimulated to reflect on new knowledge during a wildlife tourism experience, it may provoke emotional responses that reinforce current conservation perspectives and support awareness of the necessity of a particular action such as donating to a wildlife conservation project. Yet, causality between intentions and behaviour in environmental and conservation situations remains a knowledge gap in the literature. Research by Hughes (2013) suggests that the association between intentions and subsequent conservation action is complex, tenuous and unclear (p 45) due to a number of reasons including levels of effort, lack of support during the behaviour change process in tourism related situations and internal and external barriers to change. In the light of financial support for conservation projects this means that while visitors may thoroughly enjoy their wildlife tourism experience, and are concerned with protection and conservation of wildlife, it does not directly lead to an act of philanthropy (Apps et al., 2018), even though many conservation organisations solely operate on public donations to their cause (Veríssimo et al., 2018). Nevertheless, assuming the transformative character of a wildlife tourism experience in addition to the CHT principle that behavioural intentions are more easily influenced, it is proposed that a wildlife encounter in the tourism context will have a positive influence on Donation Intentions. Therefore, the following hypothesis was composed:

H3: Participating in a wildlife tourism experience increases Donation Intentions.

2.4.4 Testing the Cognitive Hierarchy Theory principles

The CHT postulates that there are linear relationships between values, value orientations, attitudes, norms, behavioural intentions and behaviour where one level of specificity is influenced by the previous ones. An interesting way to test these principles is to explore the correlations between Connectedness to Nature, Wildlife Conservation Intentions and Donation Intentions as these concepts are less abstract and more applicable to empirical and real-life situations. If the principles of the CHT are correct, then Connectedness to Nature should inform both Wildlife Conservation Intentions at the attitudinal and normative level and Donation Intentions at the behavioural intention level. In addition, Wildlife Conservation Intentions should inform Donation Intentions. In other words, an increase sense of Connectedness to Nature would mean higher Wildlife Conservation Intentions and Donation Intentions implying positive correlations between the three concepts.

However, established correlations between the different levels of the CHT have been relatively small, often explaining only a part of the variance (Sauro, 2019). For instance, values, being broad and context unspecific dispositions, are weak predictors of behavioural intentions but influence these intentions indirectly, while being mediated by other cognitions such as attitudes and norms (Jacobs & Harms, 2014; Manfredo, 2008). Attitudes in turn, can be influenced by new acquired knowledge and are often linked to pro-environmental behaviour (Zelezny, 1999). Wildlife tourism experiences often involve a type of knowledge sharing on species, environmental issues, habitats etc. which have been associated with positive attitudes towards conservation problems and intentions (Apps et al., 2018; Hughes, 2013; Jacobs & Harms, 2014). The correlation between knowledge and transformation in behaviour however, was found to be weak (Ajzen, 1991). Social and personal norms in turn, have the power to influence the relationship between attitudes and behavioural intentions through awareness of consequences or responsibility for others or the natural environment (Schwartz, 1977), which has been confirmed by various studies (Han, 2014; Steg & Groot, 2010). Mueller & Tickamyer (2020) point out that different levels of cognition are in turn influenced by many factors that are not specifically being taken into account by the CHT such as social identity, power, trust, personal history and social groupings. Moreover, the CHT does not mention the way in which the cognitive processes are connected to grouping structures in society, such as culture, geography, social organisation and identity groups which are subject to value shifts over time, probably impacting the stability of any found empirical relationships (Manfredo et al., 2020; Mueller & Tickamyer, 2020 p 3). While including these factors does not fall within the scope of the current research, it is important to keep in mind when employing a model such as the CHT, so we are aware that real-life situations are not as black and white as theory dictates. It is therefore not strange that found correlations between CHT levels are relatively small, as they are not exclusive in explaining the influence of one level on another.

Nonetheless, exploring the correlations between Connectedness to Nature, Wildlife Conservation Intentions and Donation Intentions allows for a better understanding of the dynamics within the complex human-nature relationship construct as well as a great opportunity to test the principles of the hierarchy in a less abstract form. The following three hypotheses were composed to measure the correlations between Connectedness to Nature, Wildlife Conservation Intentions and Donation Intentions.

H4: Connectedness to Nature is positively associated with Wildlife Conservation Intentions.

H5: Connectedness to Nature is positively associated with Donation Intentions.

H6: Wildlife Conservation Intentions is positively associated with Donation Intentions.

2.4.5 Uncontrollable factors that can influence the effects of a wildlife tourism experience on the human-nature relationship

A wildlife tourism experience may be influenced by some factors that cannot be controlled in a real world experiment, such as the weather. Factors that were expected to have the most influence on the wildlife tourism experience in the practical context of this research were included in the conceptual model. These uncontrollable factors, or potential confounding variables in quantitative research, are partly derived from findings of other studies and partly based on geographical and meteorological aspects typical for the location where the study was conducted. It is important to take these factors into account, as they may explain some of the variance that is otherwise fully attributed to the wildlife tourism experience, when in fact, there were other factors that influenced this effect.

Four uncontrollable factors were included in this study. First of all, *Visibility of Animals* was derived from studies by Davey (2006) and Luebke & Matiasek (2013). Visibility of animals is an uncontrollable factor in this study, because the animals that are included in the wildlife tourism experience are all living organisms with their own behavioural and seasonal patterns. This also connects to the second uncontrollable factor of *Time of Day,* which was derived from a study by Lewis et al. (2021). Behavioural patterns such as nocturnality are dependent on the time of day and influence the visibility of animals. In addition, the number of animals seen may influence the effect of a wildlife tourism experience on human-nature relationships. Encounters with animals, as well as aesthetic fascination with scenery and wildlife are fundamental parts of the contextual tourism environment, which facilitates the pathway towards transformation (Kirillova et al., 2017). Moreover, animal encounters can trigger an emotional response or feeling that may lead to a favourable attitude towards a particular species or nature as a whole (Hoberg et al., 2021; Jacobs et al., 2019). *Time of day* also links to the third and fourth uncontrollable factors of *Temperature* and *Weather Conditions*, as it tends to be cooler in the morning and warmer in the afternoon in the geographical area of the fieldwork location, which may influence the effect of a wildlife tourism experience on human-nature relationships. These meteorological factors may on the one hand affect people's mood, durability and interest (Becken et al., 2010) to actively participate in the wildlife tourism experience, and may on the other hand affect animal behaviour resulting in a lesser or greater visibility of animals. Lastly, humidity and seasonality (e.g. wet vs. dry season) are aspects within the meteorological factors that could influence the effect of a wildlife tourism experience as well.

2.5 The conceptual model

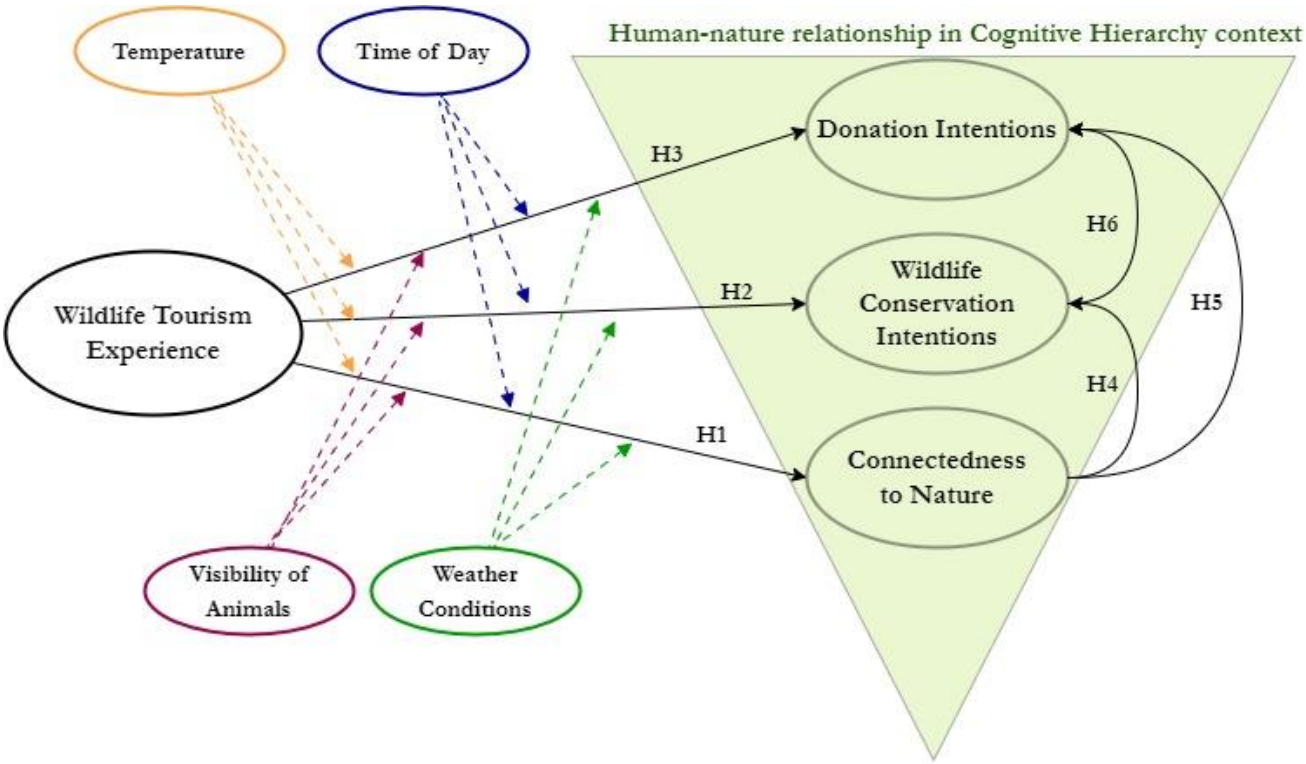

Figure 3: Conceptual model of the hypothesized causal relationships (H1-H3) between a wildlife tourism experience and Connectedness to Nature, Wildlife Conservation Intentions and Donation intentions and the hypothesized linear relationships between the measuring concepts. The dotted arrows represent uncontrollable (confounding) variables that may influence the relationship between a wildlife tourism experience and Connectedness to Nature, Wildlife Conservation Intentions and Donation intentions.

2.5.1 Hypotheses

The hypothesis that are visualised in the conceptual model and which will be tested in this research are as follows:

H1: Participating in a wildlife tourism experience does not improve Connectedness to Nature.

H2: Participating in a wildlife tourism experience increases Wildlife Conservation Intentions.

H3: Participating in a wildlife tourism experience increases Donation Intentions.

H4: Connectedness to Nature is positively associated with Wildlife Conservation Intentions.

H5: Connectedness to Nature is positively associated with Donation Intentions.

H6: Wildlife Conservation Intentions is positively associated with Donation Intentions.

Chapter 3: Methodology

A suitable research methodology is necessary to understand if, and to what extent a wildlife tourism experience has the transformative psychological potential to (re)connect humans and nature. The following chapter is dedicated to the methodology of this research. It will first discuss the practical context and background of the study area. Secondly, the study design and the operationalisation of concepts and corresponding variables will be addressed. Thereafter, the sampling and data collection procedures will be elaborated on. Finally, the data analysis procedure and conducted statistical tests will be highlighted and explained.

3.1 Practical context

3.1.1 Background

Costa Rica is a popular destination for nature-based and wildlife tourism, but also attracts many other visitors with different travel motivations. The data for the present study was collected at the Jaguar Rescue Center (JRC) in Cocles, Costa Rica, which is located on the southern Caribbean coast close to the Panamanian border. JRC was established in 2008 by Italian herpetologist Sandro Alviani and was further expanded with the help of his wife and biologist Encar García. Nowadays, the premises covers an area of approximately 22.000 m² and has the capacity of housing up to around 200 animals on a temporary basis. The JRC comprises three locations: i) the JRC Sanctuary, which is home to approximately 90 animals that cannot be released into the wild and which is open for public visitation. This is also the location of the veterinary, nursery and kitchen; ii) the JRC Rescue Center, and the temporary home for animals that may be released back into the wild. It serves as rehabilitation area for injured or orphaned animals; iii) La Ceiba Release station, a natural reserve of primary forest that forms part of the Gandoca-Manzanillo Wildlife Refuge that serves as natural release environment for rehabilitated animals.

Tourism development in the southern Caribbean area of Costa Rica has increased over the last decade, and has affected the natural habitat of much wildlife. It is one of the top reasons that animals are brought into the rescue center. Infrastructure development has led to an rise in animals who are electrocuted through powerlines, hit by vehicles, or fall down from trees (Jaguar Rescue Center, 2022). And even though JRC has substantially expanded their capacity to be able to accommodate all animals that are brought in, sometimes this does tend to be a struggle. The Ministry of Environment and Energy (*MINAE Ministerio de Ambiente y Energía*), who is in charge of legislation regarding conservation of nature and biodiversity in the Central-American republic, has set strict policies and rules regarding releases of, and interactions with wildlife. Some of these rules cause situations where animals that are brought in cannot be released back into the wild, even though they are perfectly healthy. This results in more full enclosures at JRC, which leaves less space for the animals to live in. Meanwhile, MINAE does not financially support foundations such as JRC, which makes taking care of all the animals a lot harder when restricted by these legislations.

Figure 4: Geographical location of the study area: the Jaguar Rescue Center in Cocles, Costa Rica, Central-America. Map adapted and adjusted from a study by Nost (2013).

3.1.2 The JRC Sanctuary

The data for this study was collected at the JRC Sanctuary, as this is the only location that allows public visitors. Every morning, from Monday to Sunday, two tours of respectively 1,5 hours each are organised through the Sanctuary. Visitors can then get close to the fauna of Costa Rica while learning about biology and ecology, as well as being made aware of the reasons why the animals are brought to JRC in the first place and why some of them are forced to reside there. Tours are guided by a mix of national and international young people with a passion for nature, wildlife and conservation. The guides mainly work on a voluntary basis and rely heavily on tips for their personal income. Tours are given in Spanish, English, German and French to be able to meet the needs of as many visitors as possible. Group sizes vary from five to twenty-five people, depending on language, guide availability and crowdedness. A limit of 150 visitors per day has been installed to ensure peace for the fauna and to prevent the park from crowding. People are not allowed to roam the park freely, or to take selfies or photos that include both humans and animals in the same frame. This second rule is imposed by MINAE in an attempt to protect local wildlife against exploitation for tourism purposes. Many more rules have been established by MINAE over the years that sometimes limit JRC's ability to release animals back into the wild, as pointed out before. Interestingly, while these rules are imposed, there appeared to be a lack of (financial) aid or resources to properly deal with them. JRC heavily relies on donations and revenue from the gift/coffeeshop and employment of volunteers to take care of all the animals.

3.2 Study design

In order to determine causal relationships, and to answer the research question, to what extent can wildlife tourism experiences influence the human-nature relationship, a quantitative, quasi-experimental methodological design was adopted. This means that the wildlife tourism experience here served as a treatment condition to test if it produced a difference in the outcome: the human-nature relationship, while searching for causality. A quasi-experimental design was chosen over a true experiment because random assignment of treatments to participants was not feasible or desired due to constraints in time and funds, in addition to being more convenient and less disruptive to participants and researcher (Rovai et al., 2014). Since this experiment was not conducted in a laboratory setting, but among participants of a wildlife tourism experience at JRC, this study can be considered a field-experiment. This implies that not all potentially confounding variables (see chapter 2.4.5) could be fully controlled for, as well as a non-random assignment of conditions. However, field-experiments reflect real-world settings stronger than laboratory experiments, which added to the ecological and thus external validity of the research (Jacobs & Harms, 2014).

A between-subjects design was adopted to be able to compare between different groups while avoiding bias, carryover effects and error within the participants. This means that each participant only experienced one condition (control group A or treatment group B), and that both groups consisted of different participants. A between-subjects design increases the internal validity of the research, as it is a strong method to test causal relationships and it allows to draw conclusions on the effectiveness of the treatment on the outcome variable while controlling for other variables.

3.3 Operationalisation of concepts and corresponding variables

The general consensus among visitors of JRC regarding the outcome variables Connectedness to Nature, Wildlife Conservation Intentions and Donation Intentions were measured in this study. Group A served as the control group, meaning the visitors belonging to this group did not yet participate in the wildlife tourism experience at the point of measurement (pre-WTE). Group B served as the treatment group (post-WTE), meaning that participants were measured after joining the wildlife tourism experience, so differences could be established and the effectiveness of the treatment conditions could be determined when compared to group A. The following section will discuss the operationalisation of the concepts included in this research with regard to types of variables and how they were measured and coded.

3.3.1 Independent and confounding variables

The independent variable in this study was the wildlife tourism experience, representing a scripted and guided tour at JRC available to the public. In order to get a better perspective on the nature of the wildlife tourism experience at JRC, and to see if the wildlife tourism experience was similar across different tour guides, tours were followed with all guides that provided English and Spanish speaking tours. These notes were evaluated during the data analysis so they could provide extra opportunities for discussion purposes.

A number of uncontrollable factors may have influenced the independent variable which may have affected the outcomes of the research. To limit the potential influence of these factors, they were recorded every day during the

fieldwork to be able to determine if conditions were equal on different measurement moments, as well as to examine how much of the variance may be attributed to the independent variable instead of to the confounding variables. The confounding variables that were taken into account in this study are described in more depth in chapter 2.4.5. Table 2 below gives a description of how the confounding variables were monitored and measured. Subsequently, table 3 shows the corresponding labels and codes that were used to process the data during the data analysis phase in SPSS.

*Table 2: Description of confounding variables that may influence the effect of independent variable WTE, and how these were measured and recorded during the fieldwork.*website that was used to determine and confirm weather conditions (The Weather Channel, 2023).*

Confounding variables	Description of what was recorded	Description of how variables will be monitored and measured	Type of variable (Vaske, 2008)
Visibility of Animals	How many animals were visible during one WTE.	Counted by researcher or tour guide.	Continuous (# of animals seen)
Weather	Weather conditions	Determined by researcher and compared with The Weather Channel to obtain precise data.	Categorical
Temperature	Temperature	Determined by researcher and compared with The Weather Channel to obtain precise data*.	Interval (Degrees Celsius)
Time of Day	Early morning (9.30 tour) or early afternoon (11.30 tour).	Recorded by researcher.	Dichotomous (WTE1 & WTE2)

Table 3: Confounding variables and corresponding codes and labels for SPSS data analysis.

Code	Visibility of animals	Weather conditions	Time
1	16-20 animals	Sunny conditions	WTE 1 – morning tour
2	21-25 animals	Cloudy conditions	WTE 2 – afternoon tour
3	26-30 animals	Partially cloudy/sunny	n.a.
4	31-35 animals	Clouds with partial rain	n.a.
5	n.a.	Heavy rain	n.a.

3.3.2 Dependent variables

The dependent variable in this research was the human-nature relationship. This is an abstract concept which is difficult to measure directly. To operationalise this construct, three measurable outcome variables were distinguished that each reflect a different level of the Cognitive Hierarchy Theory, as discussed in chapter 2.4. This hierarchy suggests that various wildlife cognitions exist on distinct levels of abstraction or specificity and differentiates stable but general values from more specific cognitions that people use to evaluate wildlife in general or specific wildlife encounter situations (Jacobs et al., 2012, p 5). The items that were used to measure Connectedness to Nature, Wildlife Conservation Intentions and Donation intentions can be found in appendix 1 (English) and 2 (Spanish).

3.3.2.1 Connectedness to Nature

Connectedness to Nature represents the broad, deep-rooted, trans-situational values towards nature. It is viewed as a personality characteristic or trait, which means it is particularly difficult to alter. Connectedness to Nature is a multidimensional construct with overlapping and interactional dimensions operating at different societal scales (Ives et al., 2018). It encompasses an individual's appreciation for and understanding of our interconnectedness with all other living things on earth (Nisbet et al., 2009, p 718). To obtain a relevant representation of Connectedness to Nature, a number of indicators derived from a study by (Hatty et al., 2020a) were employed. Three dimensions of the Connectedness to Nature construct were measured that comprise experiential, emotional, cognitive and philosophical connections to nature. A more detailed description can be found in table 1. All three Connectedness to Nature dimensions were measured as continuous variables according to Vaske (2008), as responses reflect a level of agreement with a statement, but it was unknown if the intervals between the values were equal (Glen, n.d.).

3.3.2.2 Wildlife Conservation Intentions

Wildlife Conservation Intentions reflect mental dispositions that favour or disfavour wildlife conservation to a certain degree which are found at the attitudinal or normative level in the CHT. These dispositions are increasingly situation specific, yet transcendent to other similar contexts. To measure wildlife conservation attitudes or intentions, a study by Miller et al. (2020) was employed and adapted to fit the current research. Up-close, multi-sensory experiences with animals and seeing them engaged in a variety of active species-typical behaviours, lead to positive emotional or empathic reactions, which then lead to conservation related outcomes (Miller et al., 2020, p 2). This underlines the theoretical perspective that a contextual tourism environment such as natural beauty or an encounter with wildlife can trigger an intense emotion and heightened cognition, which in turn can lead to a transformation (Kirillova et al., 2017). Indicators to measure Wildlife Conservation Intentions were set to personal goals to learn more about wildlife, the intent to discuss wildlife issues with others and comprehension about own responsibilities towards protection of wildlife and its habitats. These indicators were also considered continuous variables according to Vaske (2008), as it could not be known if the intervals between values were equal, as they were measured on a continuous scale with a level of agreement with a statement.

3.3.2.3 Donation Intentions

Donation Intentions reflect behavioural intentions, which are specific to a situation and predict a large part of the variance in actual behaviour (Sauro, 2019). Yet, causality between intentions and behaviour remains a knowledge gap in the literature. In the light of financial support for conservation projects this means that while visitors may thoroughly enjoy their wildlife tourism experience and are concerned with protection and conservation of wildlife, it does not directly lead to an act of philanthropy (Apps et al., 2018), even though many conservation organisations solely operate on public donations to their cause (Veríssimo et al., 2018), as is the case for JRC in the present study. Nevertheless, assuming the transformative character of a wildlife tourism experience, it was proposed that a wildlife encounter in the

tourism context will have a positive influence on Donation Intentions, and that it would predict a large part of the variance in actual behaviour. However, due to time constraints, this study did not measure actual behaviour.

3.4 Sampling procedure

As this thesis yielded a field-experiment design, sampling strategies were not desired here since all visitors of JRC were potential participants. Yet, as is demonstrated in table 4 below, all tours that took place during the fieldwork period were assigned (randomly) to either group A (control) or B (treatment). This allowed for comparison of groups to check for equivalence, to ensure that the manipulation effect could be attributed to the treatment instead of to within-group variation. To ensure that the research design achieved enough statistical power, the minimal sample size (*N*), significance criterion (α), and effect size (*ES*) were determined. Drawing on Cohen's (1992) guidelines for statistical power, the significance level (α) threshold was set at .05 to minimize the risk of committing a type 1 error. The effect size (*ES*) was expected to be medium, as theory suggested that wildlife tourism experiences can be of a psychologically transformative nature. Furthermore, a two group ANOVA test with an expected medium *ES*, and an α of .05 requires 64 participants per group according to Cohen (1992). The minimum sample size (*N*) for this study was therefore *N*= 64 x 2 = 128 people in total.

3.5 Data collection procedure

Participants of the study were reached in person in either the English, Spanish or Dutch language. In collaboration with JRC, it was allowed to approach participants before and after they participated in the wildlife tourism experience. To limit bias, only the purpose and goal of the study were briefly stated and in-depth questions were redirected to be answered after completion of the survey. The surveys were available in two languages: Spanish and English, as well as an online and offline option to maximize the reach of the survey. The online option was made available through a QR code with a link to the survey on the Qualtrics platform, which was made mobile friendly. Filling out the survey on-site was desirable to minimize survey dropout, whereas the online option was more convenient, as scores did not have to be administered manually. The offline option consisted of four printed pages that could be filled out by hand and on-site (see appendix 1 and 2). Overall, most people chose to fill out an online survey. The survey was implemented during a 2,5-week span from November 28th until December 14th, which is a time period on the verge of the high season in Costa Rica. This implied that it would be busy enough at JRC to reach the intended sample (*N*=128) and to ensure a good response rate.

Tours through the wildlife Sanctuary were organised from Monday-Sunday at respectively 9.30 and 11.30 each morning. The initial data collection schedule was focused on interchanging group A and B based on time of day. This means that on day 1 of the fieldwork, the early morning tour would serve as control group A, and the early afternoon tour as treatment group B. Day 2 would be vice versa, meaning that the 9.30 tour would serve as group B (treatment) and the 11.30 tour would be group A (control). However, renovations in the main building made it impossible for visitors to assemble at the entrance to the Sanctuary. This resulted in all visitors (people that were waiting for the tour to start and people that finished the tour) being clustered together in the coffee/gift shop area with limited indoor seating spaces. Most seating was located on the terrace, which was often wet due to frequent precipitation in the rainforest area. This turned out to

be a difficulty for the research, because it was hard to know which visitor had already completed the experience and who did not. It was therefore decided to change the schedule so each day of the experiment focused only on one condition.

Groups A and B were coded with an additional number corresponding to the day of the fieldwork, so groups could be referred to later if necessary. Changing group A and B according to the scheduled wildlife tourism experience continued each day until the end of the fieldwork period. The rationale behind this was that the confounding variables Time, Weather, Visibility of Animals and Temperature vary per day and thus may affect the outcome variable differently. By changing the groups each day, it was expected to get a more representative and generalizable outcome that could be controlled and corrected for other variables. In addition, the weather conditions and visibility of animals were be recorded every day during the fieldwork, either through own participation in the wildlife tourism experience, or through a verification with the tour guide. Recording and being aware of the confounding variables made it easier to determine if the outcome could be attributed to the main effect or an interaction effect.

Table 4: Detailed schedule of the fieldwork period from November 28 to December 14, 2023. Indicating time of measurement (before or after the wildlife tourism experience) per pre-existing tour group (WTE1 or WTE2). For example: Group 5.1B means the group was measured on the fifth day of the fieldwork period (5), as part of the morning tour (1), post- wildlife tourism experience (B).

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Week 1	28-nov	29-nov	30-nov	1-dec	2-dec	3-dec	4-dec
9.30	Group 1.1A	Group 2.1B	Group 3.1B	Group 4.1A	Group 5.1B	Group 6.1A	Group 7.1B
11.30	Group 1.2B	Group 2.2A	Group 3.2B	Group 4.2A	Group 5.2B	Group 6.2A	Group 7.2B
Week 2	5-dec	6-dec	7-dec	8-dec	9-dec	10-dec	11-dec
9.30	Group 8.1A	Group 9.1B	Group 10.1A	Group 11.1B	Group 12.1A	Group 13.1B	Group 14.1A
11.30	Group 8.2A	Group 9.2B	Group 10.2A	Group 11.2B	Group 12.2A	Group 13.2B	Group 14.2A
Week 3	12-dec	13-dec	14-dec				
9.30	Group 15.1B	Group 16.1A	Group 17.1B				
11.30	Group 15.2B	Group 16.2A	Group 17.2B				

3.6 Measurement instrument & Survey design

The concepts that represent the human-nature relationship in this research, or latent variables in quantitative research, are: Connectedness to Nature; ii) Wildlife Conservation Intentions; iii) Donation Intentions. The responses to the items measuring each variable were coded on a scale of 1, 2, 3, 4, 5, which correspond to strongly disagree, disagree, neither agree nor disagree, agree and strongly agree. In addition, two nominal variables on demographics (gender and nationality) were included to get a better overview of the population sample. A continuous variable on age was included, as well as one on having children and education level, as these might have influenced the level of concern about the environment.

3.6.1 Connectedness to Nature

The CN-12 scale (Hatty et al., 2020) was adopted to measure Connectedness to Nature, as it represents a multidimensional approach to the Connectedness to Nature construct. It demonstrated consistency with similar

measurement instruments such as the EID and NR scales (Clayton et al., 2021; Nisbet et al., 2009), which added to the criterion validity. Twelve items reflected three dimensions of Connectedness to Nature (see table 1 for detailed description of dimensions). CN-experience was measured through five items, CN-philosophy through three items and CN-identity through four items. The items and corresponding numbers, dimensions and statements can be found in table 5. All items were measured on a five-point scale. It tapped into four out of five dimensions (Ives et al., 2018) while being a much shorter measurement instrument than others. Time was an important criterion in this research design because visitors were assumed to have limited time or interest to fill out the survey, as they were either waiting for the wildlife tourism experience to start or ready to continue their journey to another destination. Therefore, a short and concise measurement instrument was preferred over a long and detailed one.

Table 5: The items that were employed to measure Connectedness to Nature with corresponding item numbers and statements derived from (Hatty et al., 2020). Different colours given to the item numbers distinguish the dimensions the item belongs to (CN-Identity, CN-Experience and CN-Philosophy).

Item #	Statement
A1	I think of myself as someone who is very concerned about taking care of nature.
A2	My relationship to nature is a big part of how I think about myself.
A3	I feel uneasy if I am away from nature for too long.
A4	I feel a strong emotional connection to nature.
A5	I feel right at home when I am in nature.
A6	Feeling connected to nature helps me deal with everyday stress.
A7	I enjoy spending time in nature.
A8	I like to get outdoors whenever I get the chance.
A9	Being in nature allows me to do the things I like doing most.
A10	Everything in nature is connected (e.g., animals, plants, humans, water, air, land, fire, etc.).
A11	Human beings and nature are connected by the same 'energy' or 'life-force'.
A12	Human wellbeing depends upon living in harmony with nature.

3.6.2 Wildlife Conservation Intentions

Wildlife Conservation Intentions were measured according to three items derived from a study by Miller et al. (2020), which were adapted to fit the current study. Item 1 reflected the personal goal to learn more about wildlife. Item 2 comprised the intent to discuss wildlife issues with others. Item 3 reflected comprehension about own responsibilities towards protection and preservation of wildlife and its habitats. Table 6 displays the items that were used to measure the concept of Wildlife Conservation Intentions.

Table 6: The items that were employed to measure Wildlife Conservation Intentions with corresponding item numbers and statements derived from (Miller et al., 2020).

Item #	Statement
B1	I want to spend more time learning about wildlife (reading books, searching the internet, watch documentaries etc.).
B2	I want to discuss wildlife topics with others and make them more aware of the conservation issues.
B3	I have a good understanding of what actions I can take that will help protect and preserve wildlife and their habitats.

3.6.3 Donation Intentions

Visitors' Donation intentions were measured through one item in the questionnaire, which was a simple and straightforward statement regarding the willingness to donate an x amount of money to a wildlife conservation project.

Table 7: The item that was employed to measure Donation Intentions with corresponding item number and statement.

Item #	Statement
C1	I want to donate an x amount of money to a project that helps protect and conserve wildlife.

3.6.4 Demographics & comments

Demographic questions were included in the survey to be able to make statements about the sample. Lastly, a question was included to give participants the opportunity to give comments on the tour or the research. This was not taken into account considering the current research, but mainly served as a potential moment of reflection for the participants, the researcher and JRC. The specific demographic questions can be found in in the surveys in appendix 1 (English) and 2 (Spanish).

3.7 Data analysis procedures

The data analysis was conducted in SPSS 28. The data collected through the Qualtrics surveys (English and Spanish) was downloaded and converted into two SPSS files and labelled in accordance with the codes mentioned earlier in this chapter. Secondly, the data was combined into one dataset and searched for irregularities and missing values. Thereafter, the reliability of the measurement scales was established. Then, descriptive statistics and frequency distributions showed how the data was spread. Subsequently, the hypotheses were tested through independent samples two tailed t-tests and ANCOVA tests. Finally, to further test the principles of the Cognitive Hierarchy Theory, a correlation analysis was conducted.

3.7.1 Data reduction and reliability analysis

The first step of the data analysis process comprised data reduction and reliability analysis to compute new indices, as multiple items were employed to reflect the same concept or indicator. The survey was built on several theoretical underpinnings while using several items to measure them. Items A1 to A12 related to Connection to Nature, B1 to B3 related to Wildlife Conservation Intentions and C1 related to the concept of Donation Intention. Secondly, items D1 to D5 concerned sample demographics, which did not have to be reduced, but only verified. The expectation that these items could be reduced into the composite indices for the concepts Connectedness to Nature, Wildlife Conservation Intentions and Donation Intentions was high, as they were deducted from existing theory and studies which were reviewed empirically (Hatty et al., 2020; Miller et al., 2020).

A reliability analysis through SPSS was conducted to assess if the items (A1-A12; B1-B3; C1) were reliable to measure the concepts of Connectedness to Nature, Wildlife Conservation Intentions and Donation Intentions. The reliability analysis provided a Cronbach's alpha α coefficient. Primarily, the overall α was assessed, as well as the item-total correlation and Alpha when item deleted. In the occasion that item-total correlations were lower than .03, or an increase occurred in Alpha when item deleted of which the value was greater than the overall Cronbach's alpha, for any item, they were removed from the composite index calculation. Subsequently, composite indices were calculated based on the mean of the scores for the items that were included in the new index. The following rules of thumb were used as guidelines for interpretation of the data: Cronbach's alpha (α= or >.65); item-total correlations (= or >.4); and an increase in alpha when item deleted (Vaske, 2008).

3.7.2 Descriptive statistics

The second step of the data analysis consisted of an assessment of the descriptive statistics in SPSS. The distribution of the data was checked for normality, kurtosis and skewness. The centre of the frequency distribution was determined on the basis of the mode, median and mean. The Standard Deviation (*SD*) was then assessed to get a grasp on how the data was spread around the mean. Scatterplots were produced in SPSS to evaluate relationships between the variables, in order to identify unusual cases which might have biased the relationships between variables and to demonstrate possible linearity of the relationship. As this study aimed for a minimum sample size (*N*) of 128 participants, it could be assumed that the data was normally distributed with a mean approximately equal to the population mean and a *SD* approximately equal to the standard error (*SE*), as is dictated by the central limit theorem (Field, 2018).

3.7.3 Inferential statistics

The third step of the data analysis involved hypotheses testing and the assessment of generalizability to the research population. Parametric tests were acceptable to use, due to the central limit theorem (Field & Hole, 2003). Furthermore, the error rate was set at 5%, which indicates a confidence interval of 95% with limits of -1.96 and +1.96 (Fisher, 1990). If the population was well represented in the sample, it would be visible in the confidence interval (Field, 2018). This demonstrated how often the true value of the population parameter (e.g., the mean) occurred within the limits of the confidence interval and made it possible to make assumptions on the representativeness of the population in the sample. The first parametric test that was employed was an independent samples two tailed t-test to be able to compare the means of group A and B. Secondly, a ANCOVA test was performed to determine the effects of the covariates. Lastly, a correlation analysis was conducted to test the principles of the Cognitive Hierarchy Theory and to explore the relationships between Connectedness to Nature, Wildlife Conservation Intentions and Donation Intentions. First as concrete examples that fit within the human-nature relationship construct as well confirming the linear relationships that are assumed between the levels of the CHT.

3.7.3.1 Comparing group means with an independent two tailed t-test

Considering that all the outcome variables (Connectedness to Nature, Wildlife Conservation Intentions, Donation Intentions) were continuous, and the participants in both groups (A and B) were different people, an independent samples two tailed t-test was performed in SPSS initially. A two tailed t-test allows comparison of two different groups consisting of different participants. It is a good way to establish if there was an effect because of the treatment condition. In order to perform this test, several assumptions needed to be met. These are primarily discussed. Thereafter, the thresholds for the independent two tailed t-test were set regarding significance levels and effect sizes.

Assumptions for independent two tailed t-test

Five assumptions needed to be met to perform an independent two tailed t-test. i) The assumption of independence declares that no participant can take part in more than one condition. All participants in this study only took part in one condition (control group A or treatment group B). No one completed a survey pre-WTE and post-WTE to avoid bias and error. ii) The variables measured are continuous in nature. Connectedness to Nature, Wildlife Conservation Intentions and Donation intentions were all measured through a level of agreement with a statement on a continuous five point scale (see chapter 3.6). iii) The data should be normally distributed. The normal distribution of the data was already established through the central limit theorem (Field, 2018), because the sample size was large enough (*N*= 284). iv) The data in both groups is obtained through random sampling. Participants were randomly approached based on a daily changing schedule. Also, since all participants of JRC were potential subjects, a particular sampling strategy was not desired in the present study, as is mentioned in chapter 3.4. v) Homogeneity of variances between groups needed to be established. This was checked through Levene's test. If p <.05, then the variance between group means was significantly different, which indicated that homogeneity of variance had been broken. If so, the row in the table that SPSS provided which mentions 'equal variance not assumed' would be utilized. Contrastingly, if p >.05, then the variance between group means was not significant, which meant that homogeneity of variance could be assumed. Thus, the table row that would be looked at in this case was 'equal variance assumed'. At the same time, Levene's test is not always reliable as it is affected by large sample sizes as well as unequal sample sizes. This was taken into account when interpreting the results.

Thresholds for the independent two tailed t-test

Consecutively, SPSS was asked to perform the independent two tailed t-test. The *t* statistic (sig. 2-tailed) was looked at to determine if there were significant differences between means of the two samples. If p <.05, then there was a significant difference between group means. If *p* >.05, then the difference was considered non-significant. The confidence interval of the difference pointed out if the two samples represented random samples from the population or not. These values should lie around 0 (Field & Hole, 2003). Lastly, the effect size of the experimental condition was expressed in Cohen's *d* and was guided by Cohen's benchmarks for effect sizes (*d*= .30 small effect; *d*= .50 medium effect; *d*= .80 large effect)(Lakens, 2013).

3.7.3.2 ANCOVA

Consecutively, an ANCOVA statistical test was performed, so the unsystematic variation caused by the confounding variables, or covariates in ANCOVA could (partly) be controlled and accounted for (Field & Hole, 2003). In other words, ANCOVA removes the effect of the covariates and gives an estimation of the true effect size of the treatment effect, which is expressed in (partial) eta squared η^2. As previous research has shown, confounds which may affect the effects of a wildlife tourism experience in this research are Time of Day (Lewis et al., 2021), Temperature, Weather (Becken et al., 2010) and Visibility of Animals (Davey, 2006; Luebke & Matiasek, 2013). Therefore, eliminating the effects of the covariates allowed for the assessment of the true effect size of the treatment condition, the wildlife tourism experience, as well as the reduction of the error variance. In order to perform an ANCOVA test several assumptions had to be met. These will be discussed in the next section, followed by the threshold regarding significance levels and effect sizes that were set for the ANCOVA test.

Assumptions for ANCOVA

The assumptions that needed to be met for the performance of an ANCOVA test are the same as for the independent two tailed t-test (chapter 3.7.3.1). In addition, the assumption of homogeneity of regression slopes needed to be met. This means that the relationship between the covariates and the outcome variable is similar in all of the groups tested. This was assessed by evaluating the interaction effects and the corresponding *p* values of the covariates time, weather, visibility of animals and temperature with the independent variable wildlife tourism experience. The alpha threshold was set at .05, which means that if $p = <.05$ the effect is significant and the assumption would be violated, and heterogeneity could be assumed instead of homogeneity.

Thresholds for ANCOVA

In the case that all the assumptions named above were met, SPSS was asked to produce the tests of between-subjects effects table which demonstrated the *p*-values of the covariates and the outcome variables when removing the effects of the covariates. Thereafter it could be established if the effects were significant or not. Thresholds for significance levels were set at .05, meaning that *p*-values below .05 were statistically significant and above .05 not-significant. Subsequently, the type 3 Sum of Squares (*SS)* row displayed what how much of the total variation was unexplained, and the amount of variance that could be attributed to the covariates. Finally, the partial eta squared η^2 values demonstrated the effect sizes of the covariates on the effect of the wildlife tourism experience on either Connectedness to Nature, Wildlife Conservation Intentions or Donation Intentions. The thresholds for determining effect sizes in partial eta squared were as follows: partial $\eta^2 = .01$ small effect, partial $\eta^2 = .06$ medium effect, partial $\eta^2 = >.14$ large effect.

3.7.3.3 Correlation analysis

To further explore the relationships between Connectedness to Nature, Wildlife Conservation Intentions and Donation Intentions, a correlation analysis was conducted in SPSS. Conducting a correlation analysis allowed scrutinization of the Cognitive Hierarchy Theory by assessing the assumed positive linear relationships between the different mental

disposition. These disposition levels were represented by Connectedness to Nature (values), Wildlife Conservation Intentions (attitudes and norms) and Donation Intentions (behavioural intentions) which simultaneously represent different elements that comprise the human-nature relationship construct. Linear relationships were first assessed by scatterplots, which indicated if either correlation coefficient Pearson's *r* or Spearman's *rho* had to be used for correlation analysis.

In the situation that significant positive correlations between Connectedness to Nature, Wildlife Conservation Intentions and Donation Intentions were found, it could be assumed that the CHT principles are correct. This would mean that there were indeed positive relationships between the CHT levels of Connectedness to Nature, Wildlife Conservation Intentions and Donation Intentions. A *p* value of <.05 indicated a statistically significant relationship between variables, and a *p* value of >.05 meant a non-significant relationship.

Secondly, the size of the correlation was determined by the correlation coefficient Spearman's rho (*rs)*, since the scatterplots did not produce a clear linear relationship between correlating variables and there were a few outliers. Statistically significant correlations were evaluated based on the following rules of thumb: *rs*= .0-.3 negligible correlation; *rs*= .3-.5 low correlation; *rs*= .5-.7 moderate correlation; *rs*= .7-.9 high correlation; *rs*= .9-1 very high correlation. The size of the relationship contributes to confirming the principles of the hierarchy regarding the influence of one level of specificity on another.

Chapter 4: Results

This study was designed to explore the psychologically transformative potential of a wildlife tourism experience with regards to the human-nature relationship. With the Cognitive Hierarchy Theory as a guideline, three concepts were chosen that fit within the human-nature relationship construct, while simultaneously representing various levels of cognitions of the CHT. The fieldwork took place at the Jaguar Rescue Center in Cocles, Costa Rica, where visitors were asked to participate in the research by filling out a survey before or after the wildlife tourism experience. The results of the field-experiment are presented in this chapter. First of all, the population sample will be introduced. Secondly, the preparation of data for hypothesis testing will be discussed. Thereafter, the hypotheses will be tested through independent samples two tailed t-tests, analysis of covariance (ANCOVA) and correlation analysis. Lastly, the findings of the nature of the wildlife tourism experience will be presented. These are not official or generalizable results, but provide some additional context for discussion purposes.

4.1 Introducing the sample

A total of 320 visitors of the Jaguar Rescue Center participated in the present study by filling out the survey. These were distributed between the dates of November 28, 2022 and December 14, 2022. Since 23 visitors only opened the online survey (22 English, 1 Spanish), but did not rate any statements, they were excluded from the study. Therefore, the response rate for the survey was 92.86%. Twelve more cases were excluded, as only items A1-A12 (*N*=7), items A1-A12; B1-B3 (*N*=4), items A1-A12; B1-B3; C1 (*N*=1) were rated. One person rated all statements and filled out demographic questions D1-D3. This case was kept as only the questions of education level and kids were missing. Looking at the dataset, the general consensus around Connectedness to Nature was rather high, as the majority of the answers were coded in 4 and 5, indicating a (strong) agreement with the statements. Because it was not yet clear if these answers were given because they were unengaged or disinterested or if they actually agreed with the statements it was decided to keep all these cases to not lose too much data in the process. Excluding all the previously named cases resulted in an overall sample size of *N*= 284 people.

As was mentioned in the methodology chapter, it was of great importance that group A and group B were similar in nature, so no problems would occur during comparison of groups in the two-tailed t-test. Appendix 3 gives an overview of the sample characteristics from group A, group B and the overall sample, and demonstrates that equality between groups could be assumed. The overall sample, which was constituted of 284 people, could be considered diverse. The participants held 27 different nationalities, with the largest groups coming from Germany (23,2%), The Netherlands (12,3%), Canada (12%), Great-Britain (11,3%) and USA (10,6%). Gender was slightly unequal, as there were more female than male participants. The age of the participants varied from 18 to 78 years old. The majority of the participants (75.6%) was highly educated, as they either obtained a Master's degree, Bachelor's degree or PhD. Finally, the vast majority of the participants did not have any children (85,6%).

4.2 Preparing the data for hypothesis testing

4.2.1 Reliability analysis

To establish if the statements from the survey in fact, reflected Connectedness to Nature, Wildlife, Conservation Intentions and Donation Intentions, the reliability of the measurement scales needed to be verified. The survey was built on several theoretical underpinnings which were reviewed empirically (Hatty et al., 2020; Miller et al., 2018). Meanwhile, because multiple items were employed to measure the three concepts, it was expected that the items could be reduced into the three composite indices for the concepts Connectedness to Nature, Wildlife, Conservation Intentions and Donation Intentions. The results of the reliability analysis showed that Connectedness to Nature was an excellent measurement scale (Vaske, 2008). The reliability of the Wildlife Conservation Intentions scale was acceptable (Vaske, 2008). One of the items did not correlate well with the total and the alpha level increased substantially when this was removed. It was therefore decided to remove this item from the new index for Wildlife Conservation Intentions. The measurement scale for Donation Intentions only consisted of one item. Therefore it was not possible to do a reliability analysis. Because it was an easy to interpret and straightforward statement to rate (*I want to donate an x amount of money to a project that helps protect and conserve wildlife*), it was assumed that it was a reliable measurement of the intention to donate.

Rules of thumb for reliability analysis
(Vaske, 2008)

- Cronbach's alpha α needs to be .65 or higher
- Item-total correlations need to be .4 or higher
- An increase in alpha when item deleted means removal of item

Results reliability analysis in Cronbach's alpha (α)

- Connectedness to nature α= .90
- Wildlife Conservation Intentions
  With 3 items α= .68
  With 2 items α= .79

Figure 5: Rules of thumb for the reliability analysis according to (Vaske, 2008). And the results of the reliability analysis for the measurement scales of Connectedness to Nature and Wildlife Conservation Intentions.

4.2.2 New indices & descriptive statistics

As the reliability of the measurement scales was established, SPSS was asked to compute new indices. This was done based on the mean of the scores on the items that were decided to be retained during the reliability analysis based on previously set rules of thumb. The new indices Connectedness to Nature, Wildlife, Conservation Intentions and Donation Intentions reflected not only different levels of the Cognitive Hierarchy Theory, but also elements that constitute the human-nature relationship. The newly computed indices were used for further analysis, and are displayed in table 8.

The descriptives for the indices Connectedness to Nature, Wildlife, Conservation Intentions and Donation Intentions can be found in appendix 4. In order to perform parametric statistical tests, the data needed to be normally distributed. As

aforementioned in chapter 3, normality could be assumed due to the large sample size (284 participants) according to the central limit theorem (Field, 2018).

Table 8: Overview of items included in the computation of new indices. The new indices were computed based on the mean of the scores for the items decided to retain after the reliability analysis. The items reflect survey statements regarding Connectedness to Nature, Wildlife Conservation Intentions and Donation Intentions. Specific items can be found in table 5-7 and appendix 1 & 2.

New Indices	Connectedness to Nature	Wildlife Conservation Intentions	Donation Intentions
Items included	12 items: A1-A12	2 items: B1-B2	1 item: C1

4.3 Comparing groups with an independent samples two tailed t-test

Upon completion of the data preparation steps, the hour had come to test the hypotheses that were formulated earlier in this research (see chapter 2.5). Independent samples two-tailed t-tests were conducted to test the main research question: to what extent can a wildlife tourism experience influence human-nature relationships? Three hypotheses (H1-H3) were composed that reflect elements of the human-nature relationship as well as various levels of the Cognitive Hierarchy Theory. Conducting t-tests allowed comparison of visitors' cognition levels of Connectedness to Nature, Wildlife Conservation Intentions and Donation Intentions in a pre-WTE, and post-WTE condition between different groups of people, while testing the principles of the Cognitive Hierarchy Theory.

The assumptions that needed to be met to perform a t-test (see chapter 3.7.3.1) were all met, besides one. Levene's test showed some significant variance between the groups when measuring Connectedness to Nature, which could cause some problems. However, because Levene's test is not always reliable as it is affected by large sample sizes as well as unequal sample sizes, it was decided to utilize the equal variances not assumed row in SPSS for all indices. The rules of thumb for the independent two tailed t-test can also be found in chapter 3.7.3.1.

Connectedness to Nature

The t-tests revealed that visitors' Connectedness to Nature did not significantly change after participating in the wildlife tourism experience. This confirms hypothesis one which posits that participating in a wildlife tourism experience does not improve Connectedness to Nature. This result is in line with the CHT principles stating that values are particularly hard to change. Yet, the average connection to nature was relatively high in both the pre-WTE (M= 4.14) and post-WTE (M= 4.23) groups.

Wildlife Conservation Intentions

No significant difference was found in Wildlife Conservation Intentions when comparing visitors' environmental dispositions in pre-WTE and post-WTE conditions. This means that hypothesis two, which states that participating in a wildlife tourism experience increases Wildlife Conservation Intentions, cannot be accepted, as no significant effect was

found during the t-test analysis. Thus, the results indicate that a wildlife tourism experience does not influence cognitions on the attitudinal and normative level.

Donation Intentions

Contrastingly, visitors' Donation Intentions were significantly higher after participating in a wildlife tourism experience. This confirms hypothesis three which postulates that participating in a wildlife tourism experience will lead to an increase in Donation Intentions. This further confirms the CHT principle that behavioural intentions are increasingly subject to change in specific contexts. Yet, the effect of the transformation in the intention to donate was found to be small. The results of the independent samples two tailed t-test are displayed in table 9.

Table 9: Results of the independent samples two-tailed t-tests for Connectedness to Nature, Wildlife Conservation Intentions and Donation Intentions. The t-test compared the means between the pre-WTE condition and the post-WTE condition to estimate the psychological effects of the wildlife tourism experience on human-nature relationship through Connectedness to Nature, Wildlife Conservation Intentions and Donation Intentions.

Variable	*t*	*df*	*p*	Mean difference	Std. error difference	Cohen's *d*	Confidence interval of the difference	
							Lower	Upper
Connectedness to Nature	-1.31	248.41	.19	-.09	.07	.16	-.22	.04
Wildlife Conservation Intentions	-.22	268.67	.83	-.02	.09	.03	-.20	.16
Donation Intentions	-2.85	270.96	.01	-.15	.09	.34	-.45	-.08

4.4 Analysis of Covariance (ANCOVA)

As we have seen in the previous section, there was only a small effect of the wildlife tourism experience on Donation Intentions. There was no significant change in either Connectedness to Nature or Wildlife Conservation Intentions, confirming both hypothesis one and three. An ANCOVA test was performed subsequently, to find out if the found effects could be completely contributed to the treatment condition of the wildlife tourism experience, or if some of the effects could be explained by uncontrollable factors. Four factors were taken into account in this study: Time of Day, Visibility of Animals, Weather Conditions and Temperature (see chapter 2.4.5). To limit the potential influence of these factors, they were recorded every day during the fieldwork to be able to determine if conditions were equal on different measurement moments. Eliminating the effects of these factors helped in determining the true effect size of the wildlife tourism experience on the human-nature relationship, as well as in reducing the error variance. The findings of the uncontrollable factors are demonstrated in appendix 5. Furthermore, all ANCOVA assumptions that were mentioned in chapter 3.7.3.2 were met. This chapter also describes the rules of thumb set for the analysis of covariance. Table 10 shows an overview of the *p* values for the homogeneity of regression slopes assumption.

Table 10: Outcomes for the homogeneity of regression slopes assumption for the Analysis of Covariance. The p values are given for the Interaction effects of covariates time, weather, visibility of animals and temperature with the wildlife tourism experience.

	Visibility of animals	Weather conditions	Temperature	Time of day
Connectedness to Nature	.73	.38	.48	.20
Wildlife Conservation Intentions	.49	.34	.05	.12
Donation Intentions	.65	.14	.11	.51

The ANCOVA tests revealed that none of the factors Visibility of Animals, Weather conditions, Temperature or Time of Day significantly influenced the effect of a wildlife tourism experience on visitors' Connectedness to Nature. The proportions of the variance in Connectedness to Nature that could be explained by Visibility of Animals, Weather conditions, Temperature or Time of Day were incredibly small and therefore not statistically significant. Yet, Visibility of Animals was found to have a small effect on the influence of a wildlife tourism experience on Connectedness to Nature. The effect of a wildlife tourism experience on Wildlife Conservation Intentions was not significantly influenced by any of the factors Visibility of Animals, Weather Conditions, Temperature or Time of Day. ANCOVA analysis revealed that the uncontrollable factors only explain a small part of the variance in Wildlife Conservation Intentions, so they can be considered insignificant. However, Time of Day explained a little more of the variance than the other factors. This was also visible in the small effect of Time of Day on the effects of a wildlife tourism experience on Wildlife Conservation Intentions. The ANCOVA test demonstrated that the effects of a wildlife tourism experience on visitors' intention to donate was not affected by any uncontrollable factors. Only a trivial and insignificant part of the variance in Donation Intentions could be explained by Visibility of Animals, Weather Conditions, Temperature and Time of Day. Thus, there were also no effects of the uncontrollable factors on the effect of a wildlife tourism experience on Donation Intentions.

Results ANCOVA

Connectedness to Nature

Temperature: *p= .53; SS= .12; partial η^2= <.01*

Visibility of Animals: *p= .25; SS= .43; partial η^2= .01*

Weather: *p= .46; SS= .17; partial η^2= <.01*

Time of Day: *p= .66; SS= .06; partial η^2= <.01*

Wildlife Conservation Intentions

Temperature: *p= .30; SS= .64; partial η^2= <.01*

Visibility of Animals: *p= .95; SS= .00; partial η^2= <.01*

Weather: *p= .95; SS= .00; partial η^2= <.01*

Time of Day: *p= .16; SS= 1.21; partial η^2= .01*

Donation Intentions

Temperature: *p= .76; SS= .06; partial η^2= <.01*

Visibility of Animals: *p= .70; SS= .09; partial η^2= <.01*

Weather: *p= 46; SS= .33; partial η^2= <.01*

Time of Day: *p= .90; SS= 01; partial η^2= <.01*

Figure 6: Results of the analysis of covariance (ANCOVA) for the uncontrollable factors Temperature, Visibility of Animals, Weather and Time of Day. The p values are given for the effects of the covariates, as well as the type 3 Sum of Squares (SS) values and effect sizes in partial eta squared η^2.

4.5 Associations between Connectedness to Nature, Wildlife Conservation Intentions and Donation Intentions

So far, the results of this research have confirmed what the Cognitive Hierarchy Theory posits. Namely, that the mental dispositions values and attitudes are hard to change, and behavioural intentions are easier to influence. This may be why visitors' Connectedness to Nature and Wildlife Conservation Intentions did not significantly change after participating in a wildlife tourism experience but Donation Intentions did increase. To further ascertain the principles of the CHT, a correlation analysis was conducted. The CHT postulates that linear relationships exist between different levels of cognitions. Since Connectedness to Nature, Wildlife Conservation Intentions and Donation Intentions represent various levels of cognitions of the CHT, they were suitable for attempting to confirm these principles, but with more concrete examples of the human-nature relationship construct. Hypotheses four to six were composed to test these principles and to verify if linear relationships indeed exist between various levels of cognitions.

Correlation analysis revealed that Connectedness to Nature, Wildlife Conservation Intentions and Donation Intentions all correlated significantly with each other. Positive linear relationships were found between the elements of the human-nature relationship, confirming the postulations of the CHT and hypotheses four to six in this research. Connectedness to Nature and Wildlife Conservation Intentions were moderately associated with each other (H4). Small relationships were found between Connectedness to Nature and Donation Intentions (H5), and between Wildlife Conservation Intentions and Donation Intentions (H6).

Most relevant correlations:

- *Connectedness to Nature & Wildlife Conservation Intentions: df= 282; rs = .58; p= <.01 at a sig. level of .01 (2tailed)*
- *Connectedness to Nature & Donation Intentions: df= 282; rs = .42; p= <.01 at a sig. level of .01 (2tailed)*
- *Wildlife Conservation Intentions & Donation Intentions: df= 282; rs = .41; p= <.01 at a sig. level of .01 (2tailed)*

Other correlations found:

- *Age & Education Level: df= 281, rs = .128, p= .032) at a sig. level of .05 (2tailed).*
- *Connectedness to Nature & Gender: df= 282, rs =.167, p= .01 at a sig. level of .01 (2tailed)*
- *Connectedness to Nature & Age: df= 282, rs = .23, p= <.01 at a sig. level of .01 (2tailed)*
- *Nationality & Wildlife Conservation Intentions: df= 282, rs = .-15, p= .01 at a sig. level of .05 (2tailed)*
- *Age & Kids: df= 281, rs = .56, p= <.01 at a significance level of .01 (2tailed)*

Figure 7: Spearman's rho correlation coefficients (rs) and corresponding p values for the revealed associations through the correlation analysis. The outcomes for the positive relationships between Connectedness to Nature, Wildlife Conservation Intentions and Donation Intentions confirm the principles of the Cognitive Hierarchy Theory.

4.6 The Wildlife Tourism Experience

The independent variable in this study was the wildlife tourism experience, representing a scripted and guided tour at the Jaguar Rescue Center Sanctuary. The wildlife tourism experience comprised a ± 1,5 hour guided tour through the Sanctuary which was available in the languages English, Spanish, French and German. The Sanctuary is the only place in the rescue centre that allows public visitors, in order to limit human-animal interactions. As is described in chapter 3.1, a limit of 150 visitors per day was installed to ensure peace for the fauna and to prevent the park from crowding. However, during the course of the fieldwork it appeared that this limit was sometimes crossed due to a large visitor demand.

In order to get a better perspective on the nature of the wildlife tourism experience at JRC, and to see if the wildlife tourism experience was similar across different tour guides, tours were followed with all guides that provided English speaking tours. The findings are presented in the following section. First of all, the fundamentals of all tours were similar. Tour guides are provided with a script when they start employment at JRC, which includes information on species, habitats, personal background of the animal, conservation matters and environmental education. Secondly, each tour guide gave their own personal spin to the script, focusing on either conservation, sad background stories, policies and lawful restrictions, and environmental awareness and education. Thirdly, all tour guides were very enthusiastic and put great emphasis on the importance of the volunteers that take care of the animals and the donations of the public, allowing JRC to continue their work. Fourthly, some tour guides engaged the group more than others. For instance, through questions, a small quiz or relating principles to people's daily lives etc. And lastly, the main animals that were included in the tour were always similar. Depending on factors such as visibility and time, other species were included as well. Visibility of wild animals that were not a part of JRC, but that were visible in the direct natural environment, added an extra layer to the tour through unexpectedness (surprise effect) and the possibility of feeling closer to nature (as these animals were not confined to living in an enclosure). Appendix 5 provides an overview of the standard animals included in the tours and wild animals that were frequently sighted during a tour at JRC.

Chapter 5: Discussion

Increasing acknowledgements of the planetary crisis have led scholars to believe there is a disconnect in modern societies between humans and the natural environment. This has been proposed as a fundamental cause of unsustainability (Ives et al., 2018). At the same time, nature-based and wildlife tourism are increasingly popular and make up a vast part of the current tourism industry (Curtin, 2013; UNEP, 2006). Scholars believe that wildlife tourism experiences can influence the human mind beyond the experience itself (Apps et al., 2018; Ballantyne et al., 2009; Curtin, 2009), making them suitable situations for achieving psychological transformation with regard to pro-environmental thoughts and actions. Yet, the results from existing research are not extremely convincing and in fact suggest that psychological and behavioural transformation is particularly hard to achieve. Therefore, this research aimed to critically examine the assumptions that tourism experiences in nature and wildlife context have a positive influence on the human-nature relationship, while searching for causal relations. The Cognitive Hierarchy Theory served as a guideline to understand how different elements within the human-nature relationship construct (e.g. Connectedness to Nature, Wildlife Conservation Intentions and Donation Intentions) relate to mental dispositions and how these dispositions inform and influence each other. In this chapter, my interpretation of the results that were presented in chapter 4 will be explicated and discussed in relation to existing research. Suggestions for future studies will be mentioned, and lastly the limitations of this study will be presented.

5.1 Main findings

The Cognitive Hierarchy Theory served as a guideline in this research to understand how cognitions exist on different levels of specificity and how they inform and influence one another. This research has tested the principles of the CHT in several ways. First of all, it has examined the principle that broad cognitions are hard to change compared to context specific dispositions (H1-H3). Secondly, the correlations between cognition levels were explored (H4-H6). Finally, these principles were tested with less abstract examples that fit within the human-nature relationship construct: Connectedness to Nature, Wildlife Conservation Intentions and Donation Intentions. The results of this research confirmed the first principle. Connectedness to Nature and Wildlife Conservation Intentions, which can be found respectively at the fundamental value and attitudinal level, did not increase through participation in a wildlife tourism experience. Contrastingly, visitors' Donation Intentions did increase after taking part in the wildlife tourism experience . This corroborates that context specific cognitions are much easier to influence with a single experience. Secondly, correlations were found between the three concepts that represented the human-nature relationship construct. Connectedness to Nature was found to have a moderate association with Wildlife Conservation Intentions and a low correlation with Donation Intentions. Wildlife Conservation Intentions and Donation Intentions were also found to have a low correlation. These results indicate that the CHT is correct and that levels of cognitions indeed inform each other, yet the influence they exert is limited and not exclusive.

5.2 Lack in psychological transformation in Connectedness to Nature and Wildlife Conservation Intentions

Previous research has suggested that tourism experiences that include wildlife encounters and effective conservation messaging are a beneficial pathway in transforming knowledge, attitudes and behaviour towards nature (Ballantyne et al., 2009; Fernández-Llamazares et al., 2020; Smith et al., 2011). Although, the vast majority of the empirical studies in this field of expertise have been in marine environments (Ballantyne et al., 2009; Fernández-Llamazares et al., 2020; Jacobs & Harms, 2014; Zeppel & Muloin, 2008). This raises the question if other environments would be suitable for transformation as well. The results of this study in a tropical environment have pointed out that psychological transformation is not easily achieved through a single wildlife tourism experience. While there was a small increase in the behavioural intention to donate money to a conservation project, no change was observed in visitors' Connectedness to Nature and Wildlife Conservation Intentions. As previously stated, the Cognitive Hierarchy Theory postulates that broad, trans-situational cognitions are slow to change. They are part of one's personality traits and identity, making them extremely difficult to influence (Jacobs et al., 2019) with a single experience. The findings of this study confirm this theory, as no transformations within Connectedness to Nature and Wildlife Conservation Intentions were observed at both the fundamental value, and attitudinal level of the CHT. Yet, other factors may have contributed to the lack in psychological transformation in this study and will be discussed in more depth in the following sections.

5.2.1 Emotional engagement and cognitive processing in a wildlife tourism experience

Scholars agree that in order for a wildlife tourism experience to be environmentally transformative, emotional engagement and cognitive processing need to take place throughout and after the tourist experience (Ballantyne, Packer, & Falk, 2011; Hoberg et al., 2021; Kirillova et al., 2017 Walker & Moscardo, 2014). Examining interpretation during a wildlife tourism experience was not within the scope of this study, but the observations during own participation in several tours at JRC provided useful insights into the nature of the wildlife tourism experience provided. It gave me some additional context on what topics were addressed and how people related to them cognitively and reacted to them emotionally. These non-generalizable findings demonstrated that the fundamentals of all the guided tours were similar, as they were based on a script provided by JRC, touching upon various topics such as conservation, tragic animal background and rescue stories, environmental education, consequences of actions, awareness raising and the importance of donations. All tour guides gave their own spin to the script by committing to one of the topics that they found most important. These findings also indicate that both the affective and cognitive aspects were addressed during each wildlife tourism experience, which are as previously mentioned, key factors in achieving transformation.

Emotional engagement during the wildlife tourism experience was highly present due to the traumatic background stories of many animals living at JRC. An example involves a spider monkey who was held in captivity while being chained to a pole, not being able to jump and play around such as monkeys do. He was forced to sit down for over fifteen years, while being fed the same food and beverages as the owners, resulting in major health issues. Currently, he is increasingly social and mobile again through JRC's efforts, and has found happiness in his troop consisting of two other rescue spider

monkeys. In addition, environmental education of the local area provided some possibilities for both emotional and cognitive engagement. Information on the main reasons for animal rescues in the southern Caribbean area of Costa Rica, including many of the animal residents of JRC, combined knowledge with emotions and sometimes feelings of guilt, as all main causes were human-induced (e.g. electrocution by powerlines, tourism purposes, orphanage through hunting, traffic accidents etc.). Feelings of guilt influence personal norms and attitudes regarding the environment (Gifford, 2014). Emotional aspects in a wildlife tourism experience have been claimed to positively impact conservation attitudes, as emotionally driven stories are more likely to be remembered at a later point in time (Fernández-Llamazares et al., 2020). In addition, emotions are associated with the motivation to view wildlife (Jacobs, 2009), and some studies have underlined the potential benefits of a wildlife tourism experience in promoting relational values (emotional and cultural connections with nature) that favour environmental stewardship (Britto dos Santos & Gould, 2018; Skubel et al., 2019). Yet still, no causal relationships were detected in the present study regarding a wildlife tourism experience and Connectedness to Nature or Wildlife Conservation Intentions. Other factors may have influenced the lack in transformation as suggested by the data. These will be discussed in the following section.

5.2.2 Context specific reasons for lack in psychological transformation

The data suggested that the visitors of JRC showed a high Connectedness to Nature on average (*M*= 4.19 on a 5-point scale) and an above average level of Wildlife Conservation Intentions (*M*= 3.89 on a 5-point scale) even before they participated in the wildlife tourism experience. This 'ceiling effect', or 'preaching to the converted' (Beaumont, 2001), implies that participants hold reasonably strong environmental attitudes before the tourism experience. The ceiling effect has been demonstrated in other nature-based tourism experiences in the rainforest (Hill et al., 2007), an eco-lodge (Sander, 2012) and in an expedition cruise (Walker & Moscardo, 2014). Yet, in a study on the influence of white shark cage-diving tourism on conservation behaviour (Apps et al., 2018), it was shown that even though participants held strong environmental attitudes prior to the experience, conservation intentions towards sharks did increase, suggesting the ceiling effect is not necessarily an issue. Although, in the present study neither Connectedness to Nature, nor Wildlife Conservation Intentions demonstrated a significant transformation, suggesting that the ceiling effect may have been apparent. JRC may see this as an opportunity in the future to expand their reach in terms of visitors beyond those with pro-environmental dispositions. Although, with Costa Rica being focused on profiling the country as the ultimate eco-tourism destination, this might bring about some difficulties. Future research should attempt to conduct an experiment with a sampling strategy that ensures inclusion of more people with a weaker connection to nature, so it becomes possible to rule out the possibility of the ceiling effect. Another idea would be to conduct a similar real-life experiment but in a different destination that is not inextricably linked to ecotourism, nature, and wildlife. This way, the ceiling effect and other potential biases may be avoided.

Furthermore, it is important to note that not all wildlife tourism experiences are suitable for facilitating transformation in environmental dispositions. It is highly possible that not all aspects of the transformative tourist experience mechanism (Kirillova et al., 2017) were properly addressed in the wildlife tourism experience in this study. Limited time to reflect and deliberate may have affected the lack in transformation. A wildlife tourism experience can evoke PET experiences, as

they are emotionally laden and highly memorable (Kirillova et al., 2017), at least in the case of JRC. Yet, as the results point out, no substantial transformation occurred. Kirillova et al.'s, (2017) model suggests that even if a state of a PET experience is reached, subsequent meaning-making was lacking which resulted in no transformation. Reasons could be that there was not enough time to reflect, self-evaluate or to make sense of emotional responses before filling out the survey for this study. Participants were asked to fill out the survey straight after they came out of the wildlife tourism experience. Cognitive processing is crucial in challenging current perspectives, so existing attitudes can adapt to new information (Walker & Moscardo, 2014). However, if there was not enough time to process new knowledge and information, it is likely that this is a valid explanation for the lack in transformation. Future studies could make alterations in the study design which gives visitors more time for reflection and evaluation. However, this might reduce the response rate substantially, as people are on holiday and therefore more prone to forget to fill out the survey at a later point in time due to other (planned) holiday activities. Finally, experiences that are mass-marketed, short-lived and lacking in interpretation for instance, have been found to be negatively associated with inspiring philanthropy towards nature and wildlife (Curtin, 2009). Since the duration of a wildlife tourism experience at JRC is short-lived (e.g. 1,5 hours), and the Sanctuary often gets crowded especially in peak season, these factors may have contributed to the lack in transformation in Connectedness to Nature and Wildlife Conservation Intentions.

5.3 Transformation in the intentions to donate to wildlife conservation projects

A causal relationship between a wildlife tourism experience and Donation Intentions was found in the present study, meaning Donation Intentions increased when people had participated in a wildlife tourism experience. This corroborates with the principles of the Cognitive Hierarchy Theory, which state that behavioural intentions are faster to change than for instance, values or attitudes. Yet, while behavioural intentions are immediate antecedents of behaviour, they do not lead directly to behaviour change. This implies that influencing behavioural intentions trough the means of a wildlife tourism experience is not necessarily an effective way of addressing environmental problems in order to improve the human-nature connection. Behavioural intentions are merely the motivation to engage in a particular behaviour, and are influenced by structural and psychological barriers to change (Gifford, 2014; Kollmuss & Agyeman, 2002). Blake (1999), has identified three barriers to action that may explain the well-known attitude-behaviour, or intention-behaviour gap. Individuality, responsibility and practicality barriers comprise hindering factors such as conflicting attitudes, locus of control, and social and institutional constraints. Because this study did not directly measure behaviour, assumptions cannot be made directly with regards to a wildlife tourism experience influencing pro-environmental behaviour. Future studies could add an additional measurement moment to the current research design where participants state if they did or did not make a donation. Although this is a self-report measure, which can weaken the validity and reliability of the research, a simple yes or no question would suffice here to be able to confirm if wildlife tourism experience influences the behaviour of donating to wildlife conservation projects. Additional qualitative questions could be added to get more insight into subjective reasons or barriers to donate after participating in a wildlife tourism experience.

5.3.1 Demographic explanations for the increase in Donation Intentions

The demographic characteristics of the participants may serve as other explanations of the increase in Donation Intentions. Even though sociodemographic factors only account for a small proportion of the variance in conservation or pro-environmental behaviour (Stern, 2000), studies have demonstrated that these factors cannot be neglected in predicting donation behaviour (Dörge et al., 2022). In general, nature-based tourists are older of age, have a higher education level and a greater income than other types of tourists (Hehir et al., 2022). All of these demographic factors have been found to have independent correlations with donating to charities (Hehir et al., 2022). Similarly, age, gender, wealth, religion, urban-rural residence, and identification with a group have been related to environmental concern (Gifford, 2014). First of all, the average age in the sample was 34,67. Some state that older people are more concerned about the environment (Gifford, 2014). Yet, currently a shift is visible in the wildlife value orientations of younger generations, as they are becoming more mutualistic (Jacobs et al., 2019; Manfredo et al., 2009, 2020). Moreover, younger people are nowadays more concerned about climate change issues and consequences (Patel, 2022; Ro, n.d.). Younger people are also more willing to donate to causes concerned with conservation and biodiversity (Dörge et al., 2022). Secondly, the majority of the participants in this study (75,6%) enjoyed a high level of education (Bachelor's degree or higher). Several studies showed that a high level of education is a predictor and a positive influence on Donation Intentions (Dörge et al., 2022), environmental support and animal protection, in addition to having a positive influence on the amount donated (Srnka et al., 2003). Thirdly, the results demonstrated that Donation Intentions were on average higher for people originating from the Global North compared to the people from Global South countries. Environmental concern is positively related to wealth on the global scale (Gifford, 2014), yet not all wealthy people are willing to donate to conservation projects. People with a higher income and education are also found to be more mutualistically oriented towards wildlife (Teel & Manfredo, 2010). Other research states that the level of concern for nature is equal or even higher within the Global South (Mostafa, 2012). These opposing results may reflect other levels of caring about the environment. People from the Global South are often more concerned with local issues, as they are more apparent to them and livelihoods are more frequently linked to the state of the direct environment. Contrastingly, these environmental issues are often not directly sensible for people in the Global North. This creates the opportunity to take a birds-eye view on global environmental issues, and making them more prone to donate to conservation projects abroad.

5.4 Observed effects of the uncontrollable factors

ANCOVA analysis revealed that none of the uncontrollable factors that were included in this study (Visibility of Animals, Time of Day, Weather and Temperature) significantly influenced the effect of a wildlife tourism experience on either Connectedness to Nature, Wildlife Conservation Intentions and Donation Intentions. Meanwhile, small effects of Visibility of Animals on Connectedness to Nature and Time of Day on Wildlife Conservation Intentions were found. Explanations are discussed in the following section.

5.4.1 Visibility of Animals and Connectedness to Nature

Even though Connectedness to Nature was not significantly influenced by any of the uncontrollable factors, a small effect of the factor Visibility of Animals was observed. This result is in line with studies that have reported a significant influence of animal presence or visibility on visitor interest in zoo exhibits (Davey, 2006). Secondly, Visibility of Animals is related to Ives et al.'s (2018) material and experiential dimension of Connectedness to Nature, or Hatty et al.'s, (2020) combined CN-experience dimension. These dimensions in turn, relate to the (Kirillova et al.'s (2017) circumstantial tourism environment as well as to the direct interaction with the properties of the natural environment the experience takes place in. Animals that were part of the JRC Sanctuary as well the wild animals seen during the wildlife tourism experience, may have served as pathways towards deeper and inner dimensions of human-nature connectedness. Aesthetic fascination with wildlife including the spontaneity of seeing wild animals may have contributed to facilitating a PET experience (Kirillova et al., 2017). So, even though the result was not statistically significant, it makes sense that Visibility of Animals had some effect on Connectedness to Nature. Future research could explore this effect in more depth by focusing on how and if, visibility of different types of species in various landscapes and tourist settings influence the psychological effect in various ways.

5.4.2 Time of Day and Wildlife Conservation Intentions

While Wildlife Conservation Intentions was not significantly influenced by any uncontrollable factors in this study, Time of Day demonstrated a small effect on Wildlife Conservation Intentions. A study by Lewis et al., (2021), has demonstrated that Time of Day is an important aspect to keep in mind when studying wildlife tourism. Animals have behavioural patterns that may or may not overlap with human activity and fixed times of a wildlife tourism experience. Therefore particular species may not be active at the time of the wildlife tourism experience. An example in the practical context of this study is that two nocturnal wildcats, a margay (Leopardus wiedii) and an ocelot (Leopardus pardalis) were part of the standard animals included in the tour at JRC. While the margay was usually visible sleeping on a tree branch, the ocelot was always hiding and sleeping in his refuge. This sometimes resulted in an emotional response of visitors being disappointed. Furthermore, factors such as seasonal considerations (e.g. hibernation) and refuge duration could influence the impact of a wildlife tourism experience (Lewis et al., 2021).

In contrast, visitors may be affected by Time of Day as well with regards to tiredness in the morning, higher temperatures in the afternoon etc. which can affect the level of interest and behaviour of the visitor in question. Thus, Time of Day may have a small effect on Wildlife Conservation Intentions, simply because if the animal is not visible or active enough, the encounter in itself may not be perceived as special and would therefore not contribute to enforcing Wildlife Conservation Intentions. Since this area is highly unexplored, future studies should focus on exploring the factors that influence the impact of a wildlife tourism experience, so they can be better managed for humans and animals alike, ensuring that the visitor has a memorable experience with many animal encounters and that the animals are ensured of enough peace and quiet.

5.5 Associations between Connectedness to Nature, Wildlife Conservation Intentions and Donation Intentions in relation to the Cognitive Hierarchy Theory

Correlation analysis revealed that there were positive relationships between Connectedness to Nature, Wildlife Conservation Intentions and Donation Intentions. These results confirm thus what the Cognitive Hierarchy Theory postulates, namely that cognitions exist on various levels of specificity and that these levels inform and influence each other. In line with previous research, the correlations between fundamental values and Connectedness to Nature as a trait have been linked to attitudes and intentions that favour nature and wildlife in many studies with regards to conservation (Bouman et al., 2020; Hughes et al., 2018; Mikołajczak et al., 2023; Xu & Fox, 2014; Zhang et al., 2014). Improving people's connection to nature is an important aim of many conservation projects and organisations, as they believe that a high sense of connectedness leads to greater conservation behaviour (Hughes et al., 2018). Yet as this research has pointed out, transforming the human-nature connection through a (single) wildlife tourism experience is not very plausible. And the relations between Connectedness to Nature and Wildlife Conservation Intentions (*rs= .58)* and Donation Intentions (*rs*= .42) are not that strong, indicating that the influence exerted from one level to another is limited. The scholarly claims that nature and wildlife encounters in tourism context foster environmental behaviour is therefore unlikely to be true, at least not in the direct sense. Even if Connectedness to Nature could improve through a wildlife tourism experience, the low to moderate correlations suggest that there are other determinants that influence the association between values and attitudes, and values and behavioural intentions within the human-nature relationship construct. Similarly, the relationship found between Wildlife Conservation Intentions at the attitudinal level and Donation Intentions at the behavioural intention level is only small (*rs*= 41). This suggests that also in this case, there are other determinants that influence the association between attitudes and behavioural intentions. This was already pointed out in chapter 2.4.4 when it was mentioned that the CHT fails to incorporate social determinants and dimensions. Cognitive processes are nested within, and heavily influenced by grouping structures throughout society such as culture, geography, social organization, and identity groups (Manfredo et al., 2020b; Mueller & Tickamyer, 2020 p 3). However, they are rarely examined in relation to the CHT. These social influences could possibly give more insight into how cognitions are constituted and why they are so difficult to change with regards to nature and wildlife conservation. The next section will discuss how social structures may influence individuals and vice versa with regards to values. It further debates on which approach to take when attempting to transform or reinforce the human-nature relationship at the value level.

The influence of social groups, institutions and organisations plays a large role in determining how people view and value nature and wildlife (Mueller & Tickamyer, 2020). Needless to say, an individual is part of many groups within society. And these groups are in turn, embedded within other groups. It is the mutual influences of these groups on within-level and cross-level dimensions that shape the overall value system in the end. Societal values cascade down through multiple levels of organizations, institutions, and individuals and are reinforced and modified through reciprocal processes that emerge upward (Manfredo et al., 2017, p 775). So while societal values influence the individual, the individual simultaneously shapes the dominant societal values. This notion of multilevel embeddedness of values was proposed by

Kasser et al. (2007), and was later empirically confirmed by Schwartz (2007). Moreover, many societies place emphasis on the collective rather than on the individual, and it is therefore expected that the influence of societal values will be larger there than within individualistic societies. This raises the question if the focus should lie on transforming personal values or societal values to achieve a stronger connection to nature? Or could it be that the connection to nature cannot be consciously steered at all?

Some believe that focusing on transforming individual cognitions which are context specific is the most effective way to achieve a strong connection to nature, as these are not rooted in institutions and social systems that are extremely difficult to alter. Focusing on individual cognitions and behaviour change would affect society at large through the multilevel embeddedness and the influence and feedback that occurs within the societal levels. A shift in societal values would then automatically occur when enough people change their thoughts and actions towards nature. Vice versa, societal values that evolve over time, influence individual values, attitudes and behaviour. This indicates that change would also naturally occur over generations, as value shifts come about in response to social-ecological surroundings (Manfredo et al., 2017). This could affect environmental dispositions and behaviour at the individual level. Look at the current young generations for instance. In general, they are more concerned with the state of the environment than older generations (Patel, 2022; Ro, n.d.). It is very plausible that a generational shift in values has occurred here. Values adapt humans to their surroundings, and the undeniable extinction event (Ives & Fisher, 2017) has most likely influenced how people see and feel connected to nature. Where older generations tend to place more emphasis on capitalistic values, younger generations tend to be more concerned with biocentric values and mutualistic value orientations (Jacobs et al., 2019; Manfredo et al., 2009, 2020). This current shift may be an adaptation to the social-ecological surroundings as the deterioration of the planet will have great (negative) consequences for the younger generations and their futures.

So should we let value shifts run their course and believe that humans will adapt to their social-ecological surroundings as we always have, and not meddle too much? Trusting that we will adapt in time to avert the climate crisis? In agreement with Ives & Fisher (2017), I would like to argue that this is not an option. The current state of the environment and the continuous and increasing deterioration of the planet does not allow to just stand back and watch. Changing, or at the least attempting to alter how people feel towards the natural environment is absolutely necessary if the climate crises is to be halted. Yes, intentionally transforming values is certainly not an easy job. But denying the possibility of a transformation in Connectedness to Nature seems to be ineffectual. Future research should therefore take the exerting influence of existing social systems on the individual psychological mental systems (e.g. cognitive & emotional) into account to get a more holistic view on how people relate to nature and what factors influence this connection to be strengthened or weakened. If more insight is gained into these factors, it may become possible to consciously steer particular interventions that could reinforce people's Connectedness to Nature. Furthermore, future studies should focus on incorporating the influence of these social structures on the various levels of cognitions within CHT, and more specifically in relation to transforming environmental dispositions. For instance, research into how societal dimensions such as power, oppression, trust, or personal history (Mueller & Tickamyer, 2020) may influence the human-nature relationship on an individual level could reveal new opportunities and implications for the management of wildlife tourism experiences. Knowledge sharing and interpretation could then be more directed at making people aware of

these structures and how individuals may have the agency to permeate these barriers to change in relation to nature and wildlife conservation.

5.6 Limitations

Regardless of the insightful findings, some limitations within this research need to be addressed. Methodological limitations include the lack of a structured random sampling strategy. This is justified because it fit the field-experiment design well. All visitors of JRC were namely potential participants for experiment, so it would not have been desirable if some of the visitors were excluded beforehand. Secondly, random assignment of conditions was not truly feasible, as participants could not be assigned to a condition before the fieldwork, because it was unknown who and how many people would participate in a particular wildlife tourism experience. Yet, all the tours that took place during the fieldwork period were randomly assigned to either group A or group B. This contributed to the ability to compare groups to check for equivalence, to ensure that the manipulation effect could be attributed to the treatment instead of to within-group variation. Lastly, there may have been other uncontrollable factors that were not taken into account in this research. Since there are no clear guidelines or theoretical underpinnings for which exact factors can influence the effects of a wildlife tourism experience on human-nature relationships, decisions had to be made to demarcate the scope of the research. The four covariates that were included in this study are not exclusive factors that may influence the effect. Yet they were derived from theories (Becken et al., 2010; Davey, 2006; Lewis et al., 2021; Luebke & Matiasek, 2013) and based on the geographical area of the research, which suggests they were suitable for the current study.

The reliability analysis revealed that the measurement scale of Wildlife Conservation Intentions was more reliable with two items ($\alpha = .79$), instead of the three items included in the survey ($\alpha = .68$). It was therefore then decided to remove this item. At the same time, it is not desirable to have less than three items in an index, and this may be seen as a limitation. Therefore, as an alternative method, the Wildlife Conservation Intentions index with three items was computed based on the mean of the scores for the three items to check for differences in the outcomes. Data analysis with the new index revealed that also when item B3 was included, there was no significant difference between pre-WTE and post-WTE conditions. Yet, ANCOVA pointed out that although no statistically significant influences were found, there were small effects of both the uncontrollable factors Temperature and Time of Day (*partial* $\eta^2 = .01$). This outcome is different from the two item index, where only Time of Day was found to have a small effect.

Another limitation is that emotions were not fully included in this research, while it was emphasized that they play an important part in achieving psychological transformation. Constraints in time and budget made me decide to not measure emotions. Limited research exists in this field of expertise, and it would therefore have broadened the scope and length of the study even more, which was not desirable at the time being. Yet acknowledging the importance of this field, especially with regard wildlife encounters and subjective tourist experiences, hopefully paves the way for future research.

Lastly, personal bias might have been a limitation in this study. As someone who feels very connected to, and concerned with nature it is sometimes hard to understand that other people do not feel the same way. In addition, my optimism

often leads me to think that spending time in nature and having encounters with wildlife will inspire people to change psychologically, while this is in fact not true and rather hard, as was demonstrated in this study. At the same time, I am aware that conducting the fieldwork abroad in Central-America has simultaneously contributed to the detriment of the planet through for instance CO2 emissions. Yet I humbly hope that this research has created some new insights for wildlife tourism managers, and more specifically for the Jaguar Rescue Center into how wildlife tourism experiences can be set up and equipped better to facilitate psychological transformation.

Chapter 6: Conclusion

Human activities are affecting the planet, while inducing disruptive societal and ecological impacts. A proposed disconnect between modern societies and the natural environment has been suggested to be a fundamental cause of unsustainability. At the same time, nature-based and wildlife tourism are more popular than ever and make up a large part of the tourism industry. Studies have suggested that spending time in nature and interactions with wildlife have the potential to transform people psychologically to be more environmentally friendly. Therefore, this research focused on the transformative psychological potential of a wildlife tourism experience to get more insight into how and if the proposed disconnect could be reinforced, and what psychological determinants should be addressed in achieving this transformation.

Guided by the Cognitive Hierarchy Theory and the transformative tourist experience mechanism, this thesis chose three concepts to measure human-nature relationship construct that are less abstract and that can be fit within multiple levels of specificity of the Hierarchy. Connectedness to Nature, Wildlife Conservation Intentions and Donation Intentions reflect respectively levels of fundamental values, attitudes and norms and behavioural intentions. The fieldwork was conducted at the Jaguar Rescue Center in Costa Rica, where 284 visitors from 27 nationalities were included in the study. Approximately half of the participants was asked to fill out a survey before participating in the wildlife tourism experience (control group A) and the other half was approached after they took part in the experience (treatment group B). The outcomes of the survey were subsequently compared to determine the influence of the wildlife tourism experience on Connectedness to Nature, Wildlife Conservation Intentions and Donation Intentions. As a second aim of the study, the associations between the three concepts were explored to test the Cognitive Hierarchy Theory on the principle that linear relations exist between the different levels of cognitions.

The results of the study confirmed the principles of the Cognitive Hierarchy Theory. First of all, broad, abstract cognitions such as values are resistant to change. Neither Connectedness to Nature or Wildlife Conservation Intentions (attitudes) demonstrated a significant difference when comparing the outcomes to the pre-WTE condition. Donation Intentions, being a context specific cognition and therefore increasingly prone to change, did significantly change after taking part in a wildlife tourism experience. A small effect was found of the wildlife tourism experience on Donation Intentions, which was in turn influenced by a small effect of covariate Time of Day. Secondly, positive associations between Connectedness to Nature, Wildlife Conservation Intentions and Donation Intentions were found, although the correlations were small to moderate. This also corroborates with the Cognitive Hierarchy principle that levels of cognitions indeed inform each other, yet the influence they exert is limited and not exclusive.

The fully answer the research question: to what extent can a wildlife tourism experience influence the human-nature relationship, more explorative research is needed into what confounding factors may further influence the potential psychological effect, as well as into necessary wildlife tourism attributes and the inclusion of emotions into psychological transformation. However, this research has demonstrated that the potential is there, yet a single experience is not likely to transform the deeper cognitions that are most important in changing someone's environmental worldview. Confirming the principles of the CHT with concrete examples demonstrates the empirical validity of the Hierarchy and

that the concepts of Connectedness to Nature, Wildlife Conservation Intentions and Donation Intentions are excellent examples to measure the human-nature relationship construct. Future research could draw on these findings while replicating the research in other nature-based and wildlife tourism contexts, so the findings can be compared and possibly generalized to other empirical situations. In addition, future studies should focus on repeated exposure to wildlife tourism experience to understand if deeper cognitions would change if more frequently engaged with.

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Appendix 1: Survey English

Questionnaire English

Dear participant,

Thank you for taking an interest in this survey. It is part of my Msc thesis on human-nature relationships as part of the Tourism, Society & Environment programme at the Wageningen University & Research in The Netherlands. With this survey I hope to get more insight into the psychological effects of a wildlife tourism experience.

In the context of this questionnaire, a wildlife tourism experience refer to a subjective evaluation and undergoing of a type of tourism which is centred around encounters with non-domesticated animals in a captive or non-captive setting. The human-nature relationship relates to a relationship between the self and natural world, which includes thoughts, feelings and behaviour.

This questionnaire will take about 5-10 minutes and will be completely anonymous.

To fill out this questionnaire online, please scan the following QR code:

A). The following section consists of 12 statements. Please rate the extent to which you agree with the following statements.
Please, only tick one box per statement.

	Strongly disagree	*Disagree*	*Neither agree nor disagree*	*Agree*	*Strongly agree*
1. I think of myself as someone who is very concerned about taking care of nature.	☐	☐	☐	☐	☐
2. My relationship to nature is a big part of how I think about myself.	☐	☐	☐	☐	☐
3. I feel uneasy if I am away from nature for too long.	☐	☐	☐	☐	☐
4. I feel a strong emotional connection to nature.	☐	☐	☐	☐	☐
5. I feel right at home when I am in nature.	☐	☐	☐	☐	☐
6. Feeling connected to nature helps me deal with everyday stress.	☐	☐	☐	☐	☐
7. I enjoy spending time in nature.	☐	☐	☐	☐	☐
8. I like to get outdoors whenever I get the chance.	☐	☐	☐	☐	☐
9. Being in nature allows me to do the things I like doing most.	☐	☐	☐	☐	☐
10. Everything in nature is connected (e.g., animals, plants, humans, water, air, land, fire, etc.).	☐	☐	☐	☐	☐
11. Human beings and nature are connected by the same 'energy' or 'life-force'.	☐	☐	☐	☐	☐
12. Human wellbeing depends upon living in harmony with nature.	☐	☐	☐	☐	☐

B). The following section consists of 3 statements. Please rate the extent to which you agree with the following statements.

Please, only tick one box per statement.

	Strongly disagree	*Disagree*	*Neither agree nor disagree*	*Agree*	*Strongly agree*
13. I want to spend more time learning about wildlife (reading books, searching the internet, watch documentaries etc.).	☐	☐	☐	☐	☐
14. I want to discuss wildlife topics with others and make them more aware of the conservation issues.	☐	☐	☐	☐	☐
15. I have a good understanding of what actions I can take that will help protect and preserve wildlife and their habitats.	☐	☐	☐	☐	☐

C). The following section consists of 1 statement. Please rate the extent to which you agree with the following statement.

Please, only tick one box per statement.

	Strongly disagree	*Disagree*	*Neither agree nor disagree*	*Agree*	*Strongly agree*
16. I want to donate an x amount of money to a project that helps protect and conserve wildlife.	☐	☐	☐	☐	☐

D). Demographic questions. Please, answer the following questions.

For the multiple choice questions, please only tick one box per question.

---

17. What gender do you identify with?

- ☐ Male
- ☐ Female
- ☐ Non-binary/third gender
- ☐ Prefer not to say

18. What is your age?

_____

19. What is your nationality?

_____

20. What is the highest level of education you have completed?

- ☐ No education completed
- ☐ High school
- ☐ Bachelor's degree
- ☐ Master's degree
- ☐ PhD or higher
- ☐ Prefer not to say

21. Do you have any children?

- ☐ No
- ☐ Yes, 1
- ☐ Yes, 2-4
- ☐ Yes > 4

22. If you would like to make any further comments on the tour or this research, please mention them below.

Appendix 2: Survey Spanish

Cuestionario Español

Estimado/a participante,

Muchas gracias por su interés en participar en esta encuesta. Es parte de mi tesis sobre las relaciones humanos-naturaleza para mi maestría en Turismo, Sociedad y el Medio Ambiente de Wageningen University & Research, en los Países Bajos. Con esta encuesta espero obtener más información sobre los efectos psicológicos de una experiencia de turismo de vida silvestre.

En el contexto de este cuestionario, las experiencias de turismo de vida silvestre se refieren a una evaluación subjetiva de un tipo de turismo centrado en encuentros con animales no domesticados en cautiverio o en libertad. Las relaciones humano-naturaleza se refieren a las relaciones de uno mismo y el mundo natural, que incluyen los proprios pensamientos, emociones y comportamiento.

El cuestionario va a durar aproximadamente 5-10 minutos y es completamente anónimo.

Para llenar este cuestionario en línea, por favor escanee el siguiente código QR:

	Totalmente en desacuerdo	*En desacuerdo*	*Ni de acuerdo ni en desacuerdo*	*De acuerdo*	*Totalmente de acuerdo*
1. Me considero una persona muy preocupada por el cuidado de la naturaleza.	☐	☐	☐	☐	☐
2. Mi relación con la naturaleza es una gran parte de como pienso en mí mismo/a.	☐	☐	☐	☐	☐
3. Me siento incómodo/a si me alejo de la naturaleza durante mucho tiempo.	☐	☐	☐	☐	☐
4. Siento una conexión emocional fuerte con la naturaleza.	☐	☐	☐	☐	☐
5. Me siento como en casa cuando estoy en la naturaleza.	☐	☐	☐	☐	☐
6. Sentirme conectado/a con la naturaleza me ayuda a lidiar con el estrés cotidiano.	☐	☐	☐	☐	☐
7. Disfruto pasar tiempo en la naturaleza.	☐	☐	☐	☐	☐
8. Me gusta salir al aire libre siempre que tengo la oportunidad.	☐	☐	☐	☐	☐
9. Estar en la naturaleza me permite hacer las cosas que más me gustan.	☐	☐	☐	☐	☐
10. Todo en la naturaleza está conectado (animales, plantas, humanos, el agua, el aire, la tierra, el fuego, etc.).	☐	☐	☐	☐	☐
11. Los seres humanos y la naturaleza están conectados por la misma 'energía' o 'fuerza vital'.	☐	☐	☐	☐	☐
12. El bienestar de los seres humanos depende de vivir en armonía con la naturaleza.	☐	☐	☐	☐	☐

B). La siguiente sección consiste en 3 afirmaciones. Por favor, valore las siguientes afirmaciones.

Marque sola una casilla por cada afirmación, por favor.

	Totalmente en desacuerdo	*En desacuerdo*	*Ni de acuerdo ni en desacuerdo*	*De acuerdo*	*Totalmente de acuerdo*
13. Quiero dedicar más tiempo a aprender sobre la vida silvestre (leer libros, buscar en Internet, ver documentales, etc.).	☐	☐	☐	☐	☐
14. Quiero hablar de temas relacionados con la vida silvestre con otras personas y sensibilizarlos sobre los problemas de conservación.	☐	☐	☐	☐	☐
15. Tengo un buen conocimiento sobre las medidas que puedo tomar para ayudar a proteger y preservar la vida silvestre y sus hábitats.	☐	☐	☐	☐	☐

C). La siguiente sección consiste en 1 afirmación. Por favor, valore la siguiente afirmación.

Marque sola una casilla por cada afirmación, por favor.

	Totalmente en desacuerdo	*En desacuerdo*	*Ni de acuerdo ni en desacuerdo*	*De acuerdo*	*Totalmente de acuerdo*
16. Quiero donar una (x) cantidad de dinero a un proyecto que ayuda a proteger y conservar la vida silvestre.	☐	☐	☐	☐	☐

D). Preguntas demográficas. Por favor, llena las siguientes preguntas.

Marque sola una casilla por pregunta, por favor.

---

17. ¿Con qué género se identifica?

- ☐ Masculino
- ☐ Femenino
- ☐ No-binario/tercer género
- ☐ Prefiero no decirlo

18. ¿Cuántos años tiene?

_____

19. ¿Cuál es su nacionalidad?

_____

20. ¿Cuál es el nivel más alto de educación que ha completado?

- ☐ No tengo educación completa
- ☐ La escuela secundaria
- ☐ Licenciatura
- ☐ Maestría
- ☐ Doctorado o más alto
- ☐ Prefiero no decirlo

21. ¿Tiene hijos?

- ☐ No
- ☐ Sí, 1
- ☐ Sí, 2-4
- ☐ Sí > 4

22. Si desea hacer algún otro comentario sobre el recorrido turístico o esta investigación, por favor, hágalo a continuación.

Appendix 3: Sample Characteristics

Sample	Number of participants	Total number of nationalities	Age		Gender			Education level					Children			
			Mean	Range	Male	Female	Third gender/ preferred not to say	High school	Bachelor	Master	PhD	None or preferred not to say	None	1	2-4	>4
Group A	134	20	34,84	18-70	37,3%	61,9%	0,7%	23,9%	34,3%	31,3%	6,0%	4,5%	86,0%	3,7%	9,7%	x
Group B	150	20	34,52	18-78	41,3%	57,3%	1,3%	15,3%	48,0%	27,3%	4,0%	4,6%	84,7%	2,7%	10,7%	1,3%
Overall Sample	284	27	34,67	18-78	39,4%	59,5%	1,1%	19,5%	41,5%	29,2%	4,9%	4,6%	85,6%	3,2%	10,2%	0,7%

Overview of the sample characteristics of the overall sample, group A and group B for the demographics Nationality, Age, Gender, Education Level and Children.

Appendix 4: Descriptive statistics of Connectedness to Nature, Wildlife Conservation Intentions & Donation Intentions

	N	Mean	SD	Skewness	Kurtosis
Connectedness to Nature					
Overall sample	284	4.19	.56	-1.02	3.42
Group A pre-WTE	134	4.14	.63	-.31	4.22
Group B post-WTE	150	4.23	.48	-.24	-.61
Wildlife Conservation Intentions					
Overall sample	284	3.89	.77	-.66	.94
Group A pre-WTE	134	3.87	.82	-.83	1.30
Group B post-WTE	150	3.90	.73	-45	.38
Donation Intentions					
Overall sample	284	3.60	.78	-.14	.10
Group A pre-WTE	134	3.46	.81	-.09	.39
Group B post-WTE	150	3.72	.74	-.11	-.28

Overview of the descriptive statistics for the new indices of Connectedness to Nature, Wildlife Conservation Intentions and Donation intentions for the overall sample, group A and group B.

Appendix 5: Results of confounding variables

Date	Group code	Temperature (in ºc)	Weather conditions	Visibility of animals
28-11	1.1A	26	Cloudy conditions	
	1.2B	27	Heavy rain	±21-25
29-11	2.2A	26	Clouds with partial rain	
	2.1B	26	Cloudy conditions	±16-20
30-11	3.1B	27	Cloudy conditions	±21-25
	3.2B	27	Cloudy conditions	±21-25
1-12	4.1A	27	Partially cloudy/sunny	
	4.2A	28	Sunny conditions	
2-12	5.1B	27	Cloudy conditions	±26-30
	5.2B	28	Partially cloudy/sunny	±31-35
3-12	6.1A	26	Sunny conditions with	
	6.2A	28	Partially cloudy/sunny	
4-12	7.1B	26	Partially cloudy/sunny	±26-30
	7.2B	27	Sunny conditions	±21-25
5-12	8.1A	27	Partially cloudy/sunny	
	8.2A	29	Sunny conditions	
6-12	9.1B	27	Sunny conditions	±26-30
	9.2B	28	Sunny conditions	±26-30
7-12	10.1A	27	Sunny conditions	
	10.2A	28	Sunny conditions	
8-12	11.1B	27	Sunny conditions	±21-25
	11.2B	28	Sunny conditions	±21-25
9-12	12.1A	26	Cloudy conditions	
	12.2A	27	Cloudy conditions	
10-12	13.1B	27	Cloudy conditions	±31-35
	13.2B	27	Clouds with partial rain	±26-30
11-12	14.1B	28	Sunny conditions	±26-30
	14.2B	28	Partially cloudy/sunny	±26-30
12-12	15.1A	27	Cloudy conditions	
	15.2A	27	Sunny conditions	
13-12	16.1B	27	Sunny conditions	±21-25
	16.2B	28	Sunny conditions	±26-30
14-12	17.1A	27	Sunny conditions	

Results of confounding variables time of day, temperature, weather conditions and visibility of animals. Groups are coded according to the day of the experiment (1-17), time of day (morning (1) or afternoon (2) tour) & group A or B (pre/post WTE). For instance, group 14.1B means that on day 14 of the experiment, people in the afternoon tour were surveyed post-WTE.

Appendix 6: Overview of animals included in wildlife tourism experience at the JRC

Standard animals in the tour:

- Collared peccary
- White tailed deer
- Spider monkeys
- Spectacle caiman
- American Crocodile
- (baby) Sloths
- Ocelot
- Margay
- Brown booby's
- Slider turtles & Mesoamerican turtles
- Parrots (blue headed & green)
- Toucan
- Great green macaw & Scarlett macaw

Sometimes included animals:

- Owls
- Snakes (this part only re-opened in the last few days of the fieldwork)

Often seen wild animals:

- Howler monkeys
- Iguana
- Aguti
- Great green macaw
- Sloth
- Toucan