

Connectedness to nature and life satisfaction of seniors: The mediating effects of tourist experience and tourist well-being

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Connectedness to nature (CTN) has been widely acknowledged as having a favourable impact on individuals participating in nature-based activities. However, existing research seems to focus on environmental outcomes overlooking the potential impact of CTN on tourist experience and well-being of individuals in general and the elderly in particular. Considering this omission and drawing on a transformative tourism perspective, the present study proposes and tests a conceptual model linking CTN with tourist experience, tourist well-being, and life satisfaction. Drawing on data collected from 211 senior individuals aged 60 and over participating in nature-based activities in the UK and Turkey, the findings confirm the positive effect of CTN on tourist experience, tourist well-being, and life satisfaction. As predicted, the findings also show that tourist well-being has a positive spill over effect on the life satisfaction of the elderly. The study makes theoretical contributions to CTN research and senior tourism scholarship and suggests important implications for both the commercial travel trade as well as local councils, NGOs, and other community associations concerned with the elderly's welfare and quality of life.

Keywords: Connectedness to nature, tourist experience, tourist well-being, life satisfaction, senior tourism.

1. Introduction

According to a recent report by the United Nations Department of Economic and Social Affairs (2022), in 2018 and for the first time, individuals aged 65 years or over outnumbered children under five. The report indicates that the population aged 65 years or over worldwide has tripled since 1980, with the current 771 million people aged 65 years or over being projected to double by 2050. While largely concerning, these figures seem to have raised attention toward healthy ageing as a significant societal issue fuelling a flourishing stream of research in different disciplines, including psychology (e.g., Fastame et al., 2022), sociology (e.g., Zhu & Walker, 2022), and tourism and hospitality (e.g., Chaulagain et al., 2021; Wen et al., 2022). Indeed, the UN Decade of Healthy Ageing (2020–2030) has been recently announced giving rise to a growing research agenda addressing healthy ageing and well-being of the elderly (Keating, 2022).

Tourism and leisure activities have been widely recognised as a path to enhancing the well-being of individuals (Hwang & Lee, 2019; Filep & Laing, 2019; Su et al., 2021). A growing stream of research focusing on the elderly also emphasises the impact of tourism and leisure activities on the well-being of the elderly (Hwang & Lee, 2019; Shergold, 2019). Elderly individuals may often engage in passive and inner pursuits (Woo et al., 2016), resulting in loneliness and social disconnectedness (Lee & Severt, 2017). Participation in leisure and tourism activities can therefore be a vital solution to mitigate loneliness and help re-build social relations, thus enhancing life expectancy and quality of life (Kim et al., 2021; Dann, 2002; Morgan et al., 2015; Kan et al., 2022; Liang et al., 2021; Shergold, 2019). Among tourism and leisure activities, nature-based activities are often associated with several benefits affecting individuals' well-being including stress reduction, increased physical activity, social contact (Samus et al. 2022), and restoring connection with the natural world (Gössling, 2002). While these benefits are particularly

important for the elderly (Capaldi et al., 2014; Samus et al., 2022), participating in nature-based activities seems to have received limited attention in tourism research focusing on the elderly (e.g., Lee et al., 2008). Although valuable, these research endeavours fail to address how connectedness to nature (CTN) can contribute to the enhancement of tourist experience, tourist well-being and eventually the life satisfaction of the elderly. This omission is intriguing given the wide recognition of the "healing power of nature for the health and well-being of older people" (Gagliardi & Piccinini, 2019, p. 315). To address this gap, the present study proposes and tests a conceptual model linking CTN with tourist experience, tourist well-being, and life satisfaction in the context of senior nature tourism (Fig. 1). The study draws on data collected from seniors participating in nature-based activities in the UK and Turkey; two countries with distinct ageing populations and strong nature-based tourism potential.

The contribution of the present study is three-fold. First, the study contributes to transformative tourism research (Sedgley et al., 2011; Teoh et al., 2021; Magrizos et al., 2021) by highlighting how CTN not only can enhance tourism experiences and tourist well-being but can also extend beyond by enhancing the psychological well-being and life satisfaction of the elderly. Second, the majority of tourism research modelling CTN tends to focus on the environmental outcomes of CTN, neglecting its potential impacts on tourist experience and well-being (see Table 1). Thus, the present study shifts attention by showcasing how CTN can bring about positive outcomes that extend beyond environmental behaviour. Third, the study investigates the underlying mechanism through which CTN influences life satisfaction by examining the mediating role of tourist experience and tourist well-being. This is important given the complexity of the CTN-life satisfaction relationship (Capaldi et al., 2014) and the scarcity of research

investigating the underpinning mechanism explaining this relationship (Zhang et al., 2014; Richardson & McEwan, 2018).

2. Literature review

2.1. Connectedness to nature and its impact on tourists

Defined as the extent to which individuals feel as a part of the natural world (Mayer & Frantz, 2004), connectedness to nature (CTN) has been examined in several academic fields, including environmental psychology (Mayer & Frantz, 2004; Nisbet & Zelenski, 2011), developmental psychology (Gosling & Williams, 2010), and leisure research (Samus et al., 2022). CTN refers to the possible emotional and/or cognitive relationships between the individual and nature arising from the human encounter with nature (Beery & Wolf-Watz, 2014). A considerable amount of research views CTN as an antecedent of sustainable consumption or pro-environmental behaviour (Nisbet & Zelenski, 2011; Mayer & Frantz, 2004). Although limited, research also shows that individuals participating in nature activities can derive positive experiences when they feel themselves as a part of nature (Davis & Gatersleben, 2013). In this regard, empirical studies have shown that CTN can have significant impact on individuals' life satisfaction and happiness levels (Howell et al., 2011; Samus et al., 2022; Swami et al., 2020; Nisbet & Zelenski, 2011).

Tourism research addressing CTN seems to concentrate on explaining the environmental behaviour of tourists or participants as a result of their visit or participation in nature-based activities (Qui et al., 2018; Beery & Wolf-Watz, 2014; Cheung et al., 2019; Han & Hyun, 2017; Maguire et al., 2020; Pearce et al., 2022; Wang et al., 2020). For instance, Pearce et al. (2022) concluded that CTN directly influences pro-environmental behaviour in protected area tourism. Similarly, Han and Hyun (2017) noted that the CTN of visitors to nature museums predicts their pro-environmental intentions. As seen in Table 1,

tourism research has generally modelled CTN as an antecedent of pro-environmental behaviour neglecting the impact of CTN on tourist experiences and the well-being of individuals. This omission is intriguing considering that leisure and tourism activities have been widely argued to play a vital role in enhancing individuals' life satisfaction and overall happiness (Sirgy, 2011; Hwang & Lee, 2019; Filep & Laing, 2019; Su et al., 2021).

Table 1. Tourism studies modelling connectedness to nature

Author(s)	Focus	Key outcomes
Pearce et al., 2022	Protected area visitors, Australia	Connectedness to nature has a significant positive effect on pro-environmental behaviour.
Wang et al., 2020	Chinese tourists to Jiuhua Mountain Scenic Area, a Buddhist site and natural scenic spot	Connectedness to nature mediates the relationship between religiosity and pro-environmental behaviour.
Maguire et al., 2020	Tourists participating in whale-related tourism, Australia and the Kingdom of Tonga	Connectedness to nature was associated with empathy and was examined as an important factor predicting conservation intention.
Yerbury & Weiler, 2020	Marine wildlife experiences, Australia	Human quest for well-being can be facilitated by wildlife experiences that promote nature connections.
Cheung et al., 2019	Chinese tourists visiting Antarctica	Chinese tourists visiting Antarctica have low connectedness to nature. The level of connectedness to nature may vary according to the culture.
Lindberg et al., 2019	Visitors to a reindeer visitor center, Norway	Connectedness to nature predicted the participation in nature interpretive centre visits.
Qiu et al., 2018	Tourists to heritage sites, China	Connectedness to nature has an indirect effect via tourism soundscape emotion on pro-environmental behaviour.
Han & Hyun, 2017	Museum Visitors, South Korea	Connectedness to nature positively and significantly influenced visitors' pro-environmental intentions.
Prebensen et al., 2017	Tourists to nature-based attractions, China, South Korea and Japan	Connectedness to nature can be used as a measurement tool in examining the concept of unity between nature and humans in neo-Confucian valued societies of China, Korea and Japan.
Wheaton et al., 2016	Tourists participating in nature-based tourism, USA	Visitors who had an increased in connectedness to nature have a high commitment to action on environmental behaviour.
Beery & Wolf-Watz, 2014	Individuals participating in outdoor recreation and nature-based tourism, Sweden	Environmental connectedness is rooted in a material/objective perspective. There is weak relationship between the measures of environmental connectedness and environmental behaviour.
Beery, 2013	Individuals participating in outdoor recreation and nature-based tourism, Sweden	Outdoor recreation has a positive relationship with environmental connectedness.
Davis & Gatersleben, 2013	Visitors to distinct natural environments (wild cliffs	Connectedness to nature can have a significant positive effect on nature experiences, varying according to the type of environment.

Despite the importance of CTN in enhancing the well-being of individuals (Samus et al., 2022; Mayer & Frantz, 2004; Wolsko & Lindberg, 2013), little attention seems to have been paid to senior tourists and the potential effect of CTN on their well-being. Unsurprisingly, research indicates that elderly individuals have a higher CTN compared to younger people (Beery, 2013; Lindberg et al., 2019; Zhang et al., 2014). A range of health benefits for older adults associated with nature connection has been identified, such as increased longevity, the overall slower decline in physical health, reducing the risk of anxiety, mental illness, and depression, as well as promoting mental well-being (Capaldi et al., 2014; Samus et al., 2022). Therefore, the present study attempts to understand how CTN can positively influence the well-being and life satisfaction of the elderly.

2.2. Tourist experience

Ensuring favourable visit experiences is crucial for destination marketers and managers (Rather, 2020). Broadly speaking, tourist experience is defined as a person's subjective assessment of events connected to travel that begin with the planning and preparation phase and continue during and after the trip by following a hierarchical time (Tung & Ritchie, 2011). Tourist experiences can vary based on different factors, including motives, personality structures, social characteristics, destination and activity type (Uriely, 2005). Research operationalises different dimensions of the tourism experience. For instance, Kang and Gretzel (2012) model learning, escape, and enjoyment as three critical dimensions of the tourism experience. Also, Chang and Hung (2021) suggest a

dimensionality of the tourist experience consisting of seven elements: learning, recreation, exhibitions, service, food, facilities, and souvenirs.

Regardless of its dimensionality, the tourist experience has received considerable attention in mainstream tourism research (Kang & Gretzel, 2012; Chang & Hung, 2021) with an emerging stream focusing on the experience of the elderly (Kim et al., 2021; Kan et al., 2022; Liang et al., 2021; Shergold, 2019). By participating in tourist activities, older individuals can experience new sights and expand their social (Dann, 2002). According to Morgan et al. (2015), by participating in tourism activities, seniors escape everyday responsibilities and worries while also having the opportunity to reflect on life experiences. Existing research explores senior travellers' experiences and highlights the positive effect of travel experiences on elderly tourists' life satisfaction (Kim et al., 2021; Kim et al., 2015; Song et al., 2018; Sie et al., 2021). Interestingly, however, research addressing CTN as a potential antecedent of favourable tourist experience and, eventually, subjective well-being is notably scarce.

2.3. Well-being of senior tourists

The concepts of life satisfaction and well-being are related to the evaluation of the general happiness level of individuals in their lives (Sirgy et al., 2011). The terms “life satisfaction”, “quality of life” or “well-being” are often used interchangeably in the literature (Altinay et al., 2019; Kim et al., 2015; Sirgy, 2019; Altinay et al., 2023a; 2023b). The World Health Organization (WHO, 2012) defines quality of life as “an individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns.” (p.11). Also “well-being is a positive state experienced by individuals and societies” and “encompasses quality of life and the ability of people and societies to

contribute to the world with a sense of meaning and purpose” (WHO, 2021, p.10). Recent studies draw attention to the distinction between the concepts of well-being and quality of life. For instance, Upton and Upton (2015) suggest that quality of life pertains to the cognitive appraisal of an individual's situation while well-being describes their emotional appraisal. Also, the scope of quality of life is broad and includes several objective indicators and subjective indicators (Linag et al., 2020). Life satisfaction measures how people evaluate their life and is “a subjective indicator that complements more objective indicators of life quality” (OECD, 2019, p.122).

Tourism and recreation are among the activities that increase individuals' well-being and quality of life (Hwang & Lyu, 2015; Uysal et al., 2016). By facilitating social interaction, leisure and tourist activities can significantly contribute to reducing loneliness, fostering relationships, and extending life expectancy and enhancing quality of life (Kim et al., 2021). As seen in Table 2, leisure and tourism studies show that the elderly’s life satisfaction is significantly enhanced by participating in tourism and recreation activities (Dann, 2002; Kan et al., 2022; Morgan et al., 2015; Xiang & Qiao, 2022).

Table 2. Well-being of the elderly in tourism and recreation literature

Source	Setting	Methods/analysis	Antecedents	Consequences
Xiang & Qiao, 2022	Senior tourism	Qualitative, Picture and in-depth interviews	Embodiment, experience, belief, environment	Subjective well-being
Feng et al., 2022	Care homes for elderlies	Mixed-methods	Employee-to-customer interaction, social connectedness	Social well-being
Kan et al., 2022	Wellness tourism	Quantitative inquiry/SEM	Local culture sharing, altruistic value, product advantage, perceived enjoyment, satisfaction with travel experience	Life satisfaction
Sie et al., 2021	Educational package tours	Quantitative inquiry/SEM	Self-determined motivations, tour preferences, memorable experiences	Life satisfaction

Liang et al., 2021	Residential tourism (retirement migrants)	Quantitative inquiry/Linear regression analysis.	Population characteristics, mobility patterns, living patterns	Subjective well-being
Pan et al., 2020	Leisure activity centers	Quantitative inquiry/SEM	Motivations, travel constraints, travel satisfaction, leisure life satisfaction	Life satisfaction
Altinay et al., 2019	Hospitality Business (local coffee shops)	Quantitative inquiry/SEM	Social interaction with customers, customer satisfaction	Social well-being
Hwang & Lee 2019	Seniors with package tour experience	Quantitative inquiry/SEM	Tourist's experience	Tourist well-being
Feng et al., 2019	Elderly living in commercial senior living facilities	Quantitative inquiry/SEM and fsQCA	Social interaction, social connectedness	Social well-being
Shergold, 2019	Rural communities	Quantitative, inquiry/ Binary logistic regression	Mobility and activity	Subjective well-being
Woo et al., 2016	Elderly communities, club and center	Quantitative/SEM	Motivation, loyalty, travel constrains, leisure life satisfaction	Overall life satisfaction
Morgan et al., 2015	Social tourism	Qualitative, Interview	Social tourism experience	Overall well-being
Kim et al., 2015	Elderly communities, club and center	Quantitative inquiry/ SEM	Involvement, perceived value, satisfaction with trip experience, leisure life satisfaction.	Quality of life (Subjective well-being)
Heo & Lee, 2010	Senior games events	Quantitative inquiry regression analysis	Behavior consistency, affective attachment, dispositional optimism, health perception	Life satisfaction
Nimrod, 2007	Leisure activity participants	Quantitative inquiry	Leisure participation	Life satisfaction
Silverstein & Parker, 2002	Leisure activity participants	Quantitative / Ordered logit analysis	Activity participation	Quality of Life
Wei & Milman, 2002	Escorted tours	Quantitative inquiry	Participation in activities	Psychological well-being
Kim, 2000	Elderly communities, club and center	Quantitative / Hierarchical multiple regression	Leisure participation	Life Satisfaction
Milman, 1998	Escorted tours	Experimental study	Travel and tourism experience	Psychological well-being

Subjective well-being is one of the most widely used approaches to explaining life satisfaction in tourism studies (Liang et al., 2021; Shergold, 2019; Kim et al., 2015; Vada et al., 2020). Diener (1984) views subjective well-being as an individual's overall assessment of their long-term life and immediate emotions. The effect of satisfaction with a specific experience on overall life satisfaction has been explained using the Bottom-up Spillover Theory (Andrews & Withey, 1976). Kim et al. (2015) view leisure satisfaction as a key domain of overall life satisfaction. Past studies indicate that leisure satisfaction of elderly individuals positively affects overall life satisfaction (Kim et al., 2015; Woo et al., 2016; Pan et al., 2020). Similarly, satisfying the tourism and travel experiences of senior tourists increase their life satisfaction (Kan et al., 2022). In this regard, tourist well-being can be considered as a sub-domain and an antecedent to overall life satisfaction.

3. Theoretical background and hypotheses development

The Biophilia hypothesis suggests that people have a natural tendency to connect with nature and that satisfying this desire positively affects well-being (Wilson, 1984). Considerable amount of research indicates that CTN positively impacts life satisfaction (Capaldi et al., 2014; Howell et al., 2011; Navarro et al., 2020). In their review study, Gagliardi and Piccinini (2019) noted that existing research agree on the healing power of nature for the well-being of the elderly. Tourism in general, and nature-based tourism, in particular, offers opportunities for individuals with a high CTN to increase their life satisfaction (Moriki et al., 2019). This may also hold for the elderly, who are likely to have a higher CTN than younger people (Beery, 2013; Lindberg et al., 2019). Thus, the following hypothesis is developed:

H1: CTN has a positive effect on life satisfaction.

Previous research indicates that CTN can influence tourist experiences in nature settings (Davis & Gatersleben, 2013; Yerbury & Weiler, 2020). For instance, Davis and Gatersleben (2013) suggested that CTN positively predicted transcendent and awe-inspiring experiences in wild nature and manicured settings. Nature tourism experience consists of three key dimensions: learning, escape and enjoyment (Kang & Gretzel, 2012). Individuals who are more connected to nature are likely to be curious to learn about the natural environment (Zhang et al., 2014). Escape from daily routines is also frequently reported in research addressing tourist experiences of the elderly (Sie et al., 2021; Song et al., 2018; Morgan et al., 2015). For instance, Lee et al. (2008) noted that nature-based senior travellers are motivated by escaping from the everyday routine, being with family and friends, and relaxing. As with leisure activities, nature-based activities that involve CTN are associated with enjoyment (Wu & Liang, 2011). In sum, we posit that the more connected to nature tourists are, the more enhanced their tourist experiences are. Based on the above discussion, the following hypothesis is developed:

H2: CTN has a positive effect on tourist experience.

Connectedness to nature is widely acknowledged to have a positive impact on the well-being of individuals (Navarro et al., 2020; Howell et al., 2011; Samus et al., 2022; Swami et al., 2020; Nisbet & Zelenski, 2011). Past studies show that individuals with stronger CTN are likely to find nature more attractive and fascinating and appreciate its beauty (Richardson & McEwan, 2018; Yerbury & Weiler, 2020). Thus, hedonic tourist well-being can increase based on connectedness to nature. Eudaimonic tourist well-being of individuals with high CTN can also be positively affected based on affiliation and competence in nature activities in the long term (Pritchard et al., 2020). Thus, CTN is expected to have a positive impact on tourist well-being. Based on the preceding discussion, the following hypothesis is proposed:

H3: CTN has a positive effect on tourist well-being.

A considerable empirical evidence indicates that tourism experience impacts the life satisfaction of tourists in general (Hwang & Lyu, 2015; Kim et al., 2015; Vada et al., 2020; Zins & Ponocny, 2022) and elderly tourists in particular (Hwang & Lee, 2019; Sie et al., 2021; Morgan et al., 2015; Kan et al., 2022). For instance, in the context of educational and cultural experiences, Sie et al. (2021) concluded that tourist experiences positively affect the life satisfaction of the elderly. Hwang and Lyu (2015) found that education, aesthetics, entertainment and escape experiences had significant effects on senior tourists' subjective well-being. In the context of nature-based tourism, Kim et al. (2015) noted that hiking tourists' experience has positive effect on quality of life. Based on these discussions, the following hypothesis is developed:

H4: Tourist experience has a positive effect on life satisfaction.

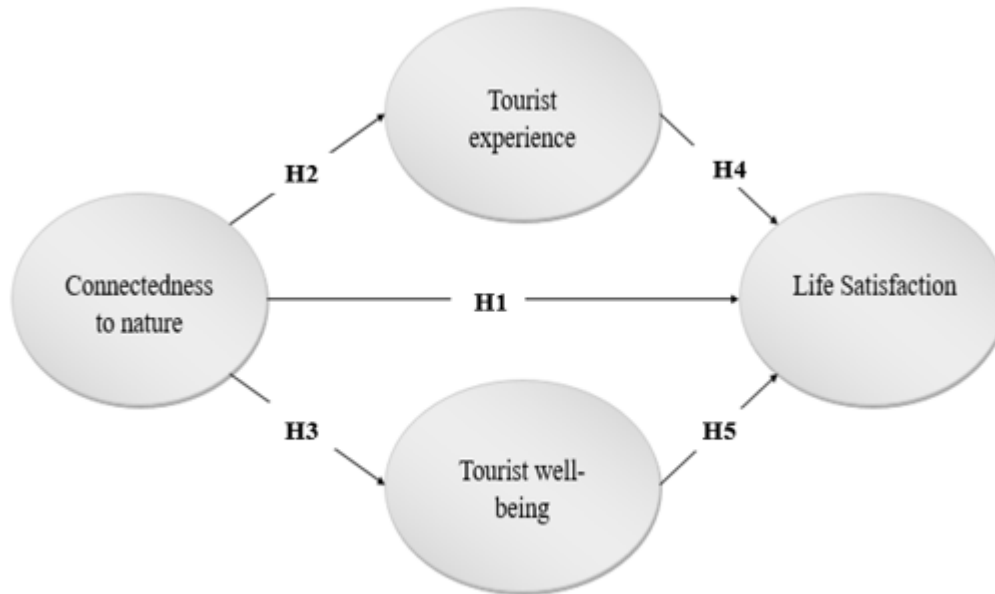
Based on the Bottom-up Spillover theory, tourist well-being can be achieved through satisfying experiences that significantly contribute to the individual's quality of life (Kim et al., 2015; Sie et al., 2021; Hwang & Lee, 2019). Neal et al. (1999) examined tourism as an essential aspect of leisure life and found that satisfaction with travel/tourism experience indirectly contributes to overall life quality. Kim et al. (2015) and more recently Kan et al. (2022) found that senior tourists' satisfaction with their travel experience affects their life satisfaction. Tourist well-being includes hedonic well-being such as satisfaction, happiness and pleasure (Vada et al., 2019) as well as autonomy, personal growth, self-acceptance and positive relations which are related to tourists' psychology and life satisfaction (Capaldi et al., 2014). Therefore, we predict that the tourist well-being of seniors, as an antecedent variable, can enhance overall life satisfaction. Thus, the following hypothesis is proposed:

H5: Tourist well-being has a positive effect on life satisfaction.

Although there is broad recognition of the link between connectedness to nature and life satisfaction (Mayer et al., 2009; Wolsko & Lindberg, 2013; Nisbet & Zelenski, 2011), tourism research modelling CTN seems to offer little on the underlying mechanism between CTN and life satisfaction. According to Capaldi et al. (2014), existing studies offer a complex view of the relationship between nature exposure, CTN, positive emotions, and life satisfaction. To better explain the relationship between CTN and life satisfaction some studies have examined the mediating effects of some variables. For instance, Zhang et al. (2014), Capaldi et al. (2014), and Richardson and McEwan (2018) employed engagement with nature's beauty as a mediator in the relationship between CTN and well-being. However, there is still a need for a better understanding of the mechanisms by which nature connectedness is linked to well-being (Richardson & McEwan, 2018; Yerbury & Wieler, 2020). Past research indicates that nature-based tourism and recreation activities that provide an opportunity to engage with nature can enhance life satisfaction (Kan et al., 2022; Navarro et al., 2020; Wolsko & Lindberg, 2013; Samus et al., 2022), yet, one may assume that CTN may contribute to the well-being of elderly via tourism experiences and tourist well-being. Based on the discussions presented above, we propose the following hypotheses:

H6: Tourist experience mediates the relationship between CTN and life satisfaction.

H7: Tourist well-being mediates the relationship between CTN and life satisfaction.



H6: Connectedness to nature → Tourist experience → Life satisfaction
H7: Connectedness to nature → Tourist well-being → Life satisfaction

Figure 1. Research model

4. Methodology

4.1. Study Settings

The study population consists of individuals aged 60 and over who participated in nature-based tours in the United Kingdom and Turkey. In both countries, the elderly population has increased in recent years. In the UK, the elderly population reached about 13 million in 2021, and it is projected that one in every four people will be aged 65 years and over by 2050 (ONS, 2021). The rapid growth of elderly population has had a large place in the UK politics with a notably growing attention given to the welfare of the elderly through supporting their mental and physical well-being, reducing their loneliness, and fostering their social inclusion (The Government Office for Science, 2019). The elderly population in the UK is also highly engaged in travel and tourism activities. In 2019, just before the pandemic, the share of tourists aged 55-64 of the total travels (99.1 million) was 17% (21.09 million), and the share of 65+ aged tourists was

17% (20.67 million) (VisitBritain, 2019). This indicates that senior tourism is a significant market segment in the UK. In Turkey, the elderly population is also gradually increasing. According to the Turkish Statistical Institute (TUIK, 2021), the population of 65 and over has increased by 24% in the last five years reaching 8 million (9.7% of the population). Population projection predicts this proportion to be 22.6% in 2060 (TUIK, 2021). Although not as much as in the UK, senior tourism has a good share of domestic tourism in Turkey with recent figures indicating that visitors aged 65 and over consist of 6.7% (5.2 million) (TUIK, 2019).

4.1. Measures

The study's constructs were operationalized using multiple-item scales derived from earlier research. CTN was measured using the Connectedness to Nature Scale, involving 14 items, developed by Mayer and Frantz (2004). Tourist experience was operationalized using nine items covering three experience dimensions (i.e., learning experience, enjoyment experience, and escape experience) developed by Kang and Gretzel (2012). Eight items were adapted from Wang et al. (2021) to measure tourist well-being. These items capture both the hedonic and eudaimonic dimensions of tourist well-being. The Satisfaction with Life Scale (Diener et al., 1984) with five items was used to measure overall life satisfaction. All scale items were measured using a 5-point scale anchored by 1 = Strongly Disagree to 5 = Strongly Agree.

4.2. Data collection

To test the proposed model, data was collected from elderly aged 60 and over who participated in nature-based tours in the United Kingdom and Turkey. Before the data collection and to ensure the content validity of the measurement instrument, an expert panel of three academics with relevant research knowledge was invited to review the

survey and provide feedback. The panel concurred that the research questionnaire was adequately organised, and the items were clear. The survey was pilot tested on 35 tourists from a convenience sample to verify face validity. After the pilot test, no major modifications were made to the questionnaire. Ethical approval for this study was obtained from Bolu Abant Izzet Baysal University Review Board (2022/277). Drawing on a random sampling technique, the data was collected over a period of four months, from 21 March 2022 until 30 July 2022. The Cohen (1992) statistical power analysis was used to evaluate the sampling adequacy. A sample size of 211 fulfils the requirement for an 80% statistical power at the 5% significance level.

4.3. Data analysis

Partial Least Squares Structural Equation Modelling (PLS-SEM) was employed to test the proposed model. Growing in popularity in tourism research, PLS-SEM was chosen given the relatively small sample in the present study and considering that PLS-SEM operates well with both large and small samples. Moreover, the skewness and kurtosis scores of several items employed in the study indicated violations of normality. PLS-SEM does not require the assumptions of normality to be met (Hair et al., 2017). The model was estimated using SmartPLS 3.3.9.

5. Results

5.1. Demographics of the participants

The majority of the participants were male (over 61%), married (53%), and have been participating in nature-based activities for more than five years by the time of data collection (88%). The sample is highly educated with around one-quarter holding a postgraduate degree. An overview of the sample is presented in Table 3.

Table 3. Profile of participants

Variable	TR Sample (N= 131)	UK Sample (N= 80)	Combined (N= 211)
Gender	%	%	%
Male	69.5	47.5	61.1
Female	30.5	52.5	38.9
Age			
60-64	68.7	66.3	67.8
65+	31.3	33.7	32.2
Marital status			
Married	63.2	40	53.6
Single	27.1	38.8	32.2
Divorced	4.5	10	6.2
Widow/widower	5.2	5	5.7
Other (Co-habiting, partner)	-	6.2	2.3
Education status			
High school graduate or less	31.3	12.6	25.2
College degree- Undergraduate	54.3	43.7	51.2
Master's degree	10.6	37.5	18.7
Ph.D. degree	3.8	6.2	4.9
Type of nature activity			
Hiking & trekking	89.3	86.2	88.6
Cycling	23.6	22.5	23.2
Mountaineering	17.5	6.2	13.2
Nature photography	22.1	27.5	24.1
Sport fishing	6.1	2.5	4.7
Water sports (diving, canoeing, sailing)	8.3	8.7	8.5
Gardening	-	11.2	4.2
Other (walking, bird watching, caving, canyoning, camping)	6.1	12.5	8.5
Participation time			
Less than 1 year	7.6	2.5	5.6
1 - 2 years	3	2.5	2.8
3 - 4 years	4.7	1.2	3.3
5 years or more	84.7	93.8	88.3
Activity party			
Alone	24.4	58.7	37.4
With Family Members or Friends	40.4	70.0	51.6
Volunteer Group (Community/ Association/ Club)	86.2	53.7	73.9
Organized Commercial Tours	7.6	15.0	10.4

5.2. Measurement Model Assessment

5.2.1. First-order reflective constructs

The validity and reliability of the measurements were evaluated before the structural

model was tested. CTN, tourist well-being, and life satisfaction were specified as first-order reflective constructs. As shown in Table 4, after dropping four items from the CTN scale, all the scales were above the recommended threshold of 0.7. As recommended by Rasoolimanesh et al. (2017), item loadings of 0.6 and above were kept as these should be removed only when they negatively affect the evaluation of other psychometric properties. All Cronbach's alpha (α), Rho_A, and CR values were above the recommended threshold of 0.7 (Hair et al., 2017) indicating all items and constructs were internally consistent. Convergent validity was also established with all the average variance extracted (AVE) for each latent variable being above the recommended 0.5 (Hair et al., 2017).

Table 4. Measurement model assessment

	λ	α	rho_A	CR	AVE
<i>First-order reflective constructs</i>					
<i>Connectedness to Nature</i>		0.913	0.925	0.927	0.562
CTN1_I often feel a sense of oneness with the natural world around me	0.752				
CTN2_I think of the natural world as a community to which I belong	0.809				
CTN3_I recognize and appreciate the intelligence of other living organisms.	0.649				
CTN5_When I think of my life, I imagine myself to be part of a larger cyclical process of living	0.680				
CTN6_I often feel a kinship with animals and plants	0.655				
CTN7_I feel as though I belong to the Earth as equally as it belongs to me	0.768				
CTN8_I have a deep understanding of how my actions affect the natural world	0.704				
CTN9_I often feel part of the web of life.	0.831				
CTN10_I feel that all inhabitants of Earth, human, and nonhuman, share a common 'life force'	0.778				
CTN11_Like a tree can be part of a forest, I feel embedded within the broader natural World	0.840				
<i>Life Satisfaction</i>		0.903	0.924	0.928	0.722
LST1_In my most ways my life is close to my ideal	0.888				
LST2_The conditions of my life are excellent	0.846				
LST3_I am satisfied with my life	0.898				
LST4_So far, I have gotten the important things I want in life	0.882				
LST5_If I could live my life over, I would change almost nothing	0.721				
<i>Tourist well-being</i>		0.928	0.930	0.941	0.665

TWL1_My nature-based activity experience has helped me become self-determining and independent	0.780				
TWL2_... has helped me have warm satisfying and trusting relationships with others	0.839				
TWL3_... has helped me possess a positive attitude toward myself	0.862				
TWL4_... has helped me feel there is meaning to present and past life	0.829				
TWL5_... has helped me develop a lost as a person	0.832				
TWL6_... has helped me have a sense of mastery and competence in managing my travel	0.776				
TWL7_... increased my overall life satisfaction	0.827				
TWL8_... experience contributed to my overall happiness	0.776				
<i>Higher order reflective-reflective construct</i>					
Learning Experience		0.929	0.930	0.955	0.876
EX-LE1_I expand my understanding of nature	0.909				
EX-LE2_I gain information and knowledge about nature	0.959				
EX-LE3_I learn many different things about nature	0.940				
Enjoyment Experience		0.858	0.858	0.914	0.781
EX-EN1_I have fun	0.818				
EX-EN2_I enjoy being in nature	0.908				
EX-EN3_I derive a lot of pleasure from the nature activities	0.921				
Escape Experience		0.822	0.826	0.893	0.736
EX-ES1_I feel like I am in another world.	0.844				
EX-ES2_I get away from it all.	0.855				
EX-ES3_I get so involve that I forget everything else.	0.875				

The square root of AVE for latent constructs and their correlations were examined to determine the discriminant validity (Fornell & Larcker, 1981; Kline, 2011). As shown in Table 4, the inter-construct correlations are less than AVE's square root, indicating that the discriminant validity is established. In addition, the Heterotrait-Monotrait (HTMT) ratio was also used to measure discriminant validity. All the HTMT ratios were below the 0.85 thresholds, as shown in Table 4, demonstrating that discriminant validity is established.

5.2.2. Higher-order reflective-reflective constructs

Tourist experience was modelled as a higher-order reflective-reflective. The disjoint two-stage approach (Sarstedt et al., 2019) was used to assess the reliability and validity of this construct. First, the lower-order dimensions (enjoyment experience, escape experience,

learning experience) of the higher-order construct (i.e., tourist experience) were included in the model and linked to the other constructs to which the higher-order construct was linked. The discriminant validity was established for all lower-order dimensions. Following this stage, the construct scores of the lower-order dimensions were saved and then used as indicators of the higher-order construct. The reliability and validity of higher-order reflective-reflective constructs were then evaluated using the usual method to assessing reflective constructs in PLS-SEM. (Sarstedt et al., 2019). Internal consistency, reliability, convergent validity (Table 4), and discriminant validity were established (Table 5).

Table 5. Discriminant analysis

	Fornell-Larcker					
	1	2	3	4	5	6
CTN	0.750					
Enjoyment_experience	0.660	0.884				
Escape_experience	0.494	0.633	0.858			
Learning_experience	0.682	0.717	0.590	0.936		
Life satisfaction	0.420	0.378	0.246	0.406	0.850	
Tourist well-being	0.636	0.666	0.690	0.747	0.491	0.816
	HTMT					
CTN						
Enjoyment_experience	0.732					
Escape_experience	0.549	0.751				
Learning_experience	0.723	0.804	0.672			
Life satisfaction	0.448	0.418	0.272	0.425		
Tourist well-being	0.671	0.741	0.785	0.804	0.521	

5.3. Structural Model Assessment

Using a bootstrapping approach with 5000 subsamples, path estimates and corresponding t-values were computed to test the research hypotheses. The model confirmed four of the five direct effect hypotheses proposed (Table 5). A significant positive relationship existed between CTN and life satisfaction ($\beta=0.21, p<0.01$), thus supporting H1. A strong

positive relationship was found between CTN and tourist experience ($\beta=0.71, p<0.01$), thus supporting H2. A strong positive relationship was also found between CTN and tourist well-being ($\beta=0.63, p<0.01$), thus supporting H3. However, there was no statistical support for the expected impact of tourist experiences on life satisfaction (H4). Finally, a significant positive relationship existed between tourist well-being and life satisfaction ($\beta=0.42, p<0.01$), thus supporting H5.

The suggested theoretical model posits that the relationship between CTN and life satisfaction is mediated by tourist experience and tourist well-being. According to Zhao et al. (2010), mediation occurs when the bootstrapped indirect effects are significant, and the confidence interval does not include value of zero. The findings show that the relationship between CTN and life satisfaction was only partially mediated by tourist well-being ($p<0.001$, BCa CI:[0.108-0.430]).

Table 5. Hypothesis testing

Hypothesis	Beta	t-value	p	Decision
H1. CTN → Life satisfaction	0.21	2.286*	0.022	Supported
H2. CTN → Tourist experience	0.71	16.819**	0.000	Supported
H3. CTN → Tourist well-being	0.636	11.341**	0.000	Supported
H4. Tourist experience → Life satisfaction	-0.084	0.799	0.424	Not Supported
H5. Tourist well-being → Life satisfaction	0.424	3.460**	0.001	Supported

* $p<0.5$; ** $p<0.01$

6. Discussions, implications and conclusion

Connectedness to nature has received considerable attention in environmental psychology (Mayer & Frantz, 2004; Nisbet & Zelenski, 2011) and to a lesser extent in tourism research (Maguire et al., 2020; Pearce et al., 2022; Wang et al., 2020). However, only few tourism studies have gone beyond the environmental outcomes by exploring how CTN can bring about a positive tourist experience while enhancing individuals' well-being

(Davis & Gatersleben, 2013; Yerbury & Weiler, 2020). In the context of senior tourism, in particular the relationships between CTN, tourist experience, and well-being remain under-studied. Drawing on a transformative tourism approach and building on previous conceptualisations, the main objective of the current investigation was to evaluate a theoretical model linking CTN with tourist experience, tourist well-being, and life satisfaction.

6.1. Theoretical implications

Findings from the present study confirm that CTN enhances tourist experience, tourist well-being, and life satisfaction. Our findings lend support to the Biophilia Hypothesis (Wilson, 1984) and confirm results from previous research highlighting the positive relationship between CTN and life satisfaction (Mayer et al., 2009; Wolsko & Lindberg, 2013; Nisbet & Zelenski, 2011; Samus et al., 2022; Swami et al., 2020). While leisure and tourism has been widely viewed as a key factor in enhancing life satisfaction (Sirgy, 2011; Kim et al., 2015; Hwang & Lee, 2019), existing tourism addressing CTN research (e.g., Pearce et al., 2022; Wang et al., 2020; Maguire et al., 2020) seems to be biased toward environmental behaviour neglecting the impact on tourist experiences and well-being of individuals. Thus, the present study shifts attention by focusing on tourism experience, tourist well-being, and life satisfaction as potential outcomes of CTN.

Our findings show that CTN enhances tourist well-being, which in turn enhances overall life satisfaction. This supports previous research highlighting the positive impact of CTN on the well-being of tourists (Howell et al., 2011; Samus et al., 2022; Swami et al., 2020; Nisbet & Zelenski, 2011) and the confirming well-being in the leisure life domain contributes to overall well-being in life (Kim et al., 2015; Woo et al., 2016; Sie et al., 2021; Pan et al., 2020). Beyond this, the present study advances the growing debate on tourist well-being as a sub-domain of life satisfaction (Sirgy et al., 2011; Kim et al.,

2015) based on the Bottom-up Spillover Theory (Andrews & Withey, 1976). Some senior tourism studies (e.g., Kan et al., 2022; Kim et al., 2015) allude to a positive association between tourist experiences and quality of life. Accordingly, the present study confirms that nature-based tourism activities lead to psychological and sociological benefits in the evaluation of individuals' general life and happiness. Transformative tourism studies also emphasise that tourist experiences have transformative power that can affect the whole lives of individuals in a hedonic and eudaimonic sense (Sedgley et al., 2011; Teoh et al., 2021; Magrizos et al., 2021). Our findings support the arguments of transformative tourism research by showcasing how seniors' tourist experience through nature-based tourism can have an impact on their touristic well-being as well as life satisfaction.

The study also contributes to topical arguments of healthy lives and promotion of well-being for all ages as one of the Sustainable Development Goals (SDGs). Examining the UN Decade of Healthy Aging Plan (2020–2030), Keating (2022) states that well-being has been central to desired outcomes and draws attention to including individual elements such as life goals and relational resources to understand the well-being of the elderly. Furthermore, senior tourists are likely to experience increased tourist well-being by selecting leisure travel goals whose attainment is likely to induce high levels of positive effect on their life satisfaction (Sirgy, 2019). Therefore, our study contributes in this direction showcasing how greater involvement in nature-based tourism activities enhances the well-being of elderly and contribute to healthy ageing.

6.2. Managerial implications

Our findings confirm the positive effect of CTN on the elderly's tourist experience, tourist well-being, and life satisfaction. These findings suggest that CTN not only fosters individuals' leisure experiences but also contributes to their psychological well-being. At a micro level, travel trade targeting seniors can emphasise both the leisure and health

benefits in their marketing strategies. At a macro level, destination management organisations (DMOs) can invest in nature-based tourism and the concept of CTN as a lucrative option for the senior tourism market. Again, emphasising the health benefits for the elderly participating in nature-based activities not only contributes to creating greater demand but, more importantly, contributes to emphasising the role of tourism and leisure activities in addressing societal issues, including healthy ageing.

The findings also have significant implications for local councils, NGOs and other community associations working on enhancing the quality of life of the elderly. It has become clear that CTN enhances tourist well-being and improves the life satisfaction of the elderly participating in nature-based activities. A logical implication is that nature-based activities that provide participants with opportunities to connect to nature can be used as a tool to contribute to healthy ageing and improve the quality of life of the elderly. Hence, local councils, NGOs, and other community associations focusing on the elderly can actively seek to build partnerships with tourism stakeholders (e.g., travel agencies) and civil society organisations (e.g., charities) involved in organising nature-based activities for the elderly.

6.3. Limitations and future directions

The current study is not without limitations. First, it is worth highlighting that the present study uses a cross-sectional study design drawing on a relatively small sample drawn from two countries (i.e., UK and Turkey). Future research may employ longitudinal study designs using larger samples in different contexts. Second, the present study focuses only on how connectedness to nature impacts on tourist experience, tourist well-being, and life satisfaction of the elderly, future research may build on and extend the current framework by modelling other variables such as emotional well-being and social well-being as potential outcomes of connectedness to nature. Finally, the present

study assumes seniors participating in nature-based activities as a homogenous group, there may be an opportunity to undertake a segmentation study clustering seniors based on different variables including levels of CTN, type of activity, tourist engagement, and overall life satisfaction.

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