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ORIGINAL ARTICLE

Tourism and transitions toward sustainability: developing tourists' pro-sustainability agency

Aisling Force[1] · **David Manuel-Navarrete**[1] · **Karina Benessaiah**[2]

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Abstract Leveraging human agency for sustainability transitions may benefit from interventions at the subjective level. This paper explores nature-based tourism as an example of a social process through which pro-sustainability agency could be promoted in tourists. We examine the potential of nature-based tourism to advance sustainability through a model linking tourism experience, personal change and pro-sustainability agency. Our conceptual model is explored through an empirical study of tourists surveyed before and after one-day whitewater rafting tours on Costa Rica's Pacuare River. Results suggest that tourists' past experiences, motivation, predispositions to change and fit with personal development processes are leveraging factors for the design of nature-based experiences that promote pro-sustainability agency. These findings have significant implications for the design of tourism, including ways to extend tourists' experiences, increase collaboration among tourism operations and enhance the guides' role in tour impact. This research highlights tourism sustainability as a necessary complement to sustainable tourism, and the opportunity of tourism actors to design activities that encourage pro-sustainability agency.

Keywords Sustainability transitions · Tourism sustainability · Ecotourism · Change agent · Personal change · Whitewater rafting

"We must begin thinking like a river if we are to leave a legacy of beauty and life for future generations" – David Brower.

Introduction

Global trends call for urgent transformations and transitions toward sustainability (Kates and Parris 2003; Olsson et al. 2014). In this article, we argue that sustainability transitions could be supported by nature-based tourism, or ecotourism, designed to foster pro-sustainability agency in tourists. While recognizing its value, our focus goes beyond *sustainable tourism,* i.e., efforts to make tourism activities locally sustainable, to also understand *tourism sustainability*, i.e., the design of tourism activities in ways that contribute to sustainability transitions globally (Manuel-Navarrete 2016; Moscardo and Murphy 2014). Our research specifically focuses on *tourism for sustainability transitions*, which we identify as a subset of tourism sustainability research. We explore how ecotouristic experiences might lead to personal change in tourists' identities, which then might translate into pro-sustainability agency. This differs from ecotourism literature that focuses on destination impacts (Weaver and Lawton 2007) and ecotourists' characteristics (Deng and Li 2014; Dolnicar et al. 2008; Perkins and Brown 2012). Understanding the link between tourism experience and personal change is key to designing ecotourism activities in ways that promote

Handled by Arnim Wiek, Arizona State University, USA.

✉ Aisling Force
aislingforce@gmail.com

[1] School of Sustainability, Arizona State University, 800 S. Cady Mall, P.O. Box 875502, Tempe, AZ 85287-5502, USA

[2] School of Geographical Sciences and Urban Planning, Arizona State University, 975 S. Myrtle Ave., P.O. Box 875302, Tempe, AZ 85287-5302, USA

tourism sustainability. We argue that personal change can foster ecotourists to become "change agents" for these sustainability transitions (Westley et al. 2013).

For the majority of urbanites, travel is an important means for keeping personal connections with nature. Connections with nature foster happiness and well-being, which reinforce our identities and sustainable behavior (Russell et al. 2013; Zelenski and Nisbet 2014). Additionally, nature-based tourism can be transformative by temporally dislocating individuals from their quotidian matrix of social relations forcing them to face untried situations (Notzke 2016; Pearce et al. 2017; Walter 2016). We hypothesize that feeding personal connections with nature, dislocating individuals from daily routine and citified practices and challenging them to navigate untested waters can lead to personal transformation supportive of sustainability transitions.

If the above is correct, then tourism actors can shape tourism experiences to facilitate personal change (Christie and Mason 2003) in order to promote pro-sustainability agency. This is consistent with findings that assert tourism's potential to support sustainability lifestyle change (Gelter 2010), where lifestyles can be seen as manifestations of social identities, or the roles and memberships claimed to represent oneself (Deaux 1993). Global sustainability challenges call for wider and global forms of identity, beyond the conventional forms of in-group identification (Sedikides and Brewer 2002; van Veelen et al. 2015). These extended identities are defined here as pro-sustainability identities transcending in-group and out-group dynamics through "in-planet identification" with individuals pursuing congruent and sustainable relations between the personal and collective (Bendik-Keymer 2012; Manuel-Navarrete 2015).

To test the link between tourism experiences and tourist personal changes, we conducted an empirical study of whitewater rafting on Costa Rica's Pacuare River. Tourism, whitewater rafting and their associated development in Costa Rica reveal conflicting development pathways. Ideal for both whitewater rafting and hydropower development, the Pacuare River's future is complicated and uncertain. Sustainability controversies and paradoxes exist across Costa Rica, where attempts to become the first carbon neutral nation by 2021, for instance, have prompted an increased hydropower capacity. Tourism and biodiversity conservation have to be weighted against hydropower development and climate change mitigation benefits (Fletcher 2009). In Costa Rica, water has historically been a seemingly abundant natural resource, incentivizing extensive hydropower development in recent decades. The government-owned electricity company, Costa Rica Institute of Electricity (ICE), continually benefits from energy development including plans to expand large hydropower, while simultaneously claiming to focus on sustainable development, environmental protection and social responsibility. ICE reported that 98.2% of electricity production in 2016 was renewable, with hydropower responsible for 74.4%.[1] Water sustainability in Costa Rica, however, is complex and requires improved democratic processes and capacity, especially as climate change impacts stress current water governance and politics tend to favor high impact tourism and development (Kuzdas et al. 2016).

It is from this complex background, that we highlight river tourism and whitewater rafting as examples of nature-based tourism, or ecotourism (Powell et al. 2009; Prideaux et al. 2009). Small groups, personalized instruction, and high education and interpretation contents characterize whitewater rafting. These characteristics provide a rich opportunity to explore the concept of tourism for sustainability transitions. Whitewater rafting's combination of adventure and risk, active engagement with nature, intimate guide contact, and sensory peaks and troughs can potentially trigger transformative opportunities. Arnould and Price (1993) considered the interpersonal contact and dynamic of river trips to be important and claimed that "rafting provides absorption and integration, personal control, joy and valuing, a spontaneous letting-be of the process, and a newness of perception and process" (p. 41). Many qualities of whitewater rafting relate to Breakey and Breakey's (2015) discussion of Aldo Leopold's "cultural harvest" principle concerning transformative tourism and involving five elements: story, beauty and esthetic appreciation, rarity and trophy, signature and personality, and knowledge and learning. These elements may be key in creating tourism experiences that promote sustainability transitions and will be discussed in further detail throughout this paper.

Tourism for sustainability transitions

Sustainable tourism has focused on minimizing negative local impacts of tourism activities rather than the sector's global impacts and exponential growth (Saarinen 2014). With tourism predominantly regarded through an economic lens, to make it "sustainable" depends on reducing the related environmental and social costs. The actual balancing, however, is ruled by guest satisfaction and industry profits, while maintaining recreational services that support the industry and local communities' well-being often take a back seat (Andersen et al. 2016; Liu 2003). The industry is far from being locally or globally sustainable, and sustainability is not yet a mainstream concept guiding the

[1] http://grupoice.ticoblogger.com/2017/01/03/costa-rica-supera-98-de-generacion-renovable-por-segundo-ano-consecutivo/.

sector's decisions and culture (Buckley 2012). Even while promoting sustainability within their tourism sector, Costa Rica is no exception to this case and struggles with balancing economic, political and environmental priorities.

Tourism sustainability seeks to expand the sustainable tourism paradigm by suggesting that tourism can also be a driving force for sustainability transitions beyond the tourism sector alone (Manuel-Navarrete 2016), or a "tool for sustainability" (Moscardo and Murphy 2014). Tourism for sustainability transitions can draw on a number of alternative tourism concepts with implications for both the design of tourism experiences and the overall relationship of the sector with broader political, economic and environmental dynamics. For example, hopeful tourism is a normative, emotional, creative and holistic approach that incorporates sustainability and values "co-transformative learning and action" to promote human development (Pritchard et al. 2011 p. 953). In a sustainability ethic approach, "tourism can play a crucial consciousness-raising role" facilitating human virtue, development and commitment to environmental and cultural protection (Breakey and Breakey 2015 p. 87). Tourism can also value interpretation and experiences that encourage sustainable behavior (Walker and Moscardo 2014). Experiences enabled by tourism have the potential for transformational impacts on the tourist (Reisinger 2013). Finally, pro-social designs of tourism activities could palliate the alienation caused by capitalist relations of production, consumerism and the diverse existentialist challenges posed by modernity (Xue et al. 2014).

Whitewater rafting is a consumptive activity involving commercial outfitters and international travel. To be truly sustainable, whitewater rafting in particular and tourism in general require radical changes in the governance and political conditions under which they operate (Hall 2011; Manuel-Navarrete 2016). Governance for sustainable tourism must focus on ethics, justice and its operations within the global and local community (Dangi and Jamal 2016). This requires challenging societal values of growth and consumerism and the current industry's pro-economic growth dogma (Higgins-Desbiolles 2009). This evokes the idea of change agents for sustainability. The ability of tourism to change tourists, however, remains questionable given the lack of evidence in Antarctic cruise and "last chance tourism" to encourage tourists to become ambassadors for the place and cause (Eijgelaar et al. 2010). In this context, Vila and others (2015) suggest that enhanced education of tourists may be key to influencing their ambassador role. Antarctic tourism operators may highlight critical issues through environmental education to improve tourists' local knowledge; however, improvements are needed in interpretation and outreach efforts to link to tourists' "ambassador behaviors" (Powell et al. 2008, p. 238). In the end, tourism for sustainability transitions may be more about moving people internally in a way so they can change the world. Or, as Breakey and Breakey (2015) put it, the question is "*how can tourism make us sustainable*" (p. 87)?

We are interested in expanding the conceptual grasp of change agents within sustainability. Tour operators and guides may become change agents in their social contexts (e.g., promoting river conservation laws) as well as designers of experiences oriented to promote pro-sustainability agency in tourists. Although linked to nature relatedness and pro-environmental concern and behavior (Nisbet et al. 2009), broader connectedness and empowerment are important in establishing pro-sustainability identities. Our interest is how tourists achieve awareness of their relationship to the global collective and can become active participants in sustainability transitions. Costa Rica, with its symbolic status for tourists as a sustainable tourism icon, facilitates this investigation. With the potential of tourism to compel us to act as "agents of sustainability" (Breakey and Breakey 2015, p. 93), how can we learn to design tourism and encourage the industry to promote these personal changes?

Conceptual model

We propose that tourist experiences, provided through tourism activities and mediated through both the environmental setting and tourism actors' guidance, act as a medium for personal change (Fig. 1). Tourist experiences can promote change within individuals' world perspective and behaviors (Reisinger 2013), and experiences influence identity development (Deaux 1993). We find it important to recognize that all tourists arrive to their travel destinations with a compilation of previous experiences, motivation, dispositions, etc.—which may influence outcomes from the tourism experience (Ardoin et al. 2015). Guides and other actors involved in designing and facilitating tourist experiences have the opportunity to build on personal past experience and orient activities to encourage personal change (Tussyadiah 2014).

For experience creation, a focus has been on the guides' central role; however, tourism operators and administrative staff may play comparable roles to guides. All interact with tourists, where purposeful tourism actor training and orientation are potential pathways to promote transformative tourist experiences. An element of experiences that tourism actors may provide is deliberate sustainability-oriented interpretation, as Moscardo (2015) argued for tourism interpretation that seeks to promote sustainable lifestyles beyond the destination. Specifically, guide-provided interpretation has been shown to cause positive awareness,

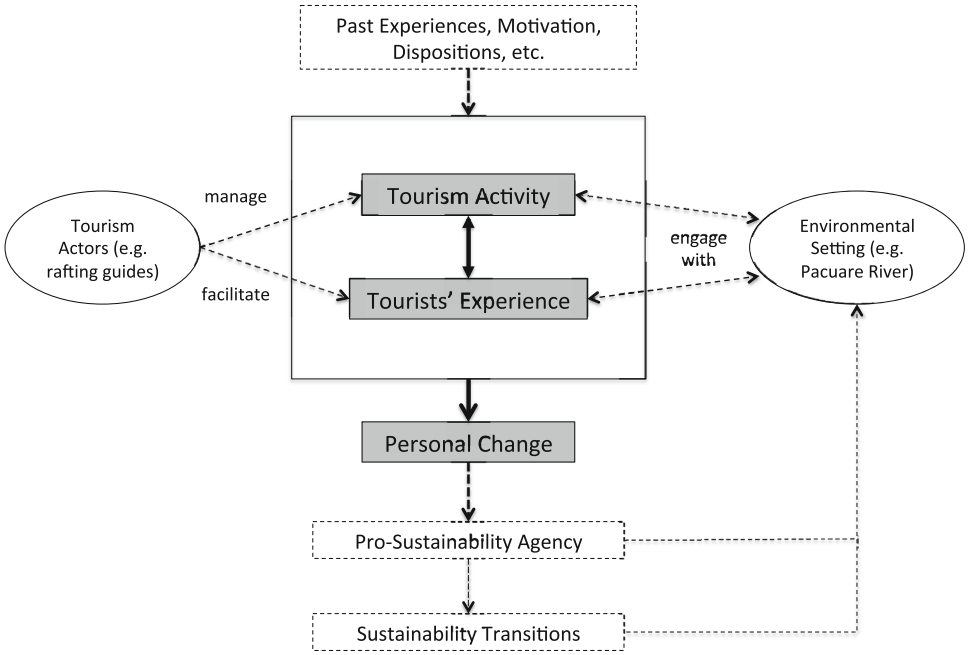

Fig. 1 Conceptual model of transformative tourism experiences, potentially leading to personal change and pro-sustainability agency

attitude and behavioral changes among tourists (Curtin 2010; Littlefair and Buckley 2008; Weiler and Ham 2001), where guide quality and training can be key (Christie and Mason 2003; Cohen 1985). Emotional interpretation has also been found as more important than responsibility and knowledge interpretation in influencing conservation intentions among whale tourists (Jacobs and Harms 2014). In many cases, however, interpretation may fall short and there is a need to first consider the past experience, motivation, dispositions, etc. tourists bring to activities and the forms of engagement that may be key in triggering personal change. There is also a need to consider some elements that interpretation typically excludes, like a focus on subjective engagement with nature—interaction, appreciation and ethics—and experiences as having a cumulative effect (Wearing and Archer 2002). Ultimately, tourists may be encouraged to exert their power and manifest what they need and desire from tourism engagement (Xue et al. 2014).

Our model and approach seem particularly pertinent to river tourism. Rivers are important sources for human experiences of recreation, adventure and escape (Palmer 2004), where their waters' engage our senses and provide exceptional opportunities for environmental connection. As a resource, water is crucial for essentially any human activity, and yet many live disconnected from this life-giving resource, including the pedagogical value of rivers' cyclic nature as a metaphor for sustainability. Echeverria and others (1989) claim that rivers provide key locations for human–nature experiences, a reason why humans are universally drawn to rivers and other flowing bodies of water. The universal attraction of rivers suggests that river tourists already have previous experiences with such water bodies and the natural resource. These moving networks connect and nourish our planet, where our connection with them may provide opportunity to self-reflect and navigate personal change processes. Importantly, this vision of rivers competes with their status in Costa Rica, where rivers are generally valued for their economic and development opportunities.

Whitewater rafting is an archetype of the adventure tourism industry (Buckley 2009) and an embodiment of the five elements of the "cultural harvest" mentioned in "Introduction" as key for tourism experiences to change tourists (Breakey and Breakey 2015). First, whitewater rafting can provide a heightened emotional experience (Holyfield 1999) and entails active tourist engagement within an outdoors setting. Second, rivers appeal to both local and distant tourists, as a travelers' destination where storytelling builds the areas' attractiveness (Prideaux et al. 2009). Third, river tourists interact directly and personally with guides who also broaden the tourists' experience and can vary their approach to provide experiences adapted to various tourist types (Buckley 2009). Fourth, whitewater rafting involves emotional highs and lows as the tourist delves into the beauty of the natural setting and navigates the challenges and tranquility of the environment. Lastly, the activity naturally embodies elements of a "choreographed" experience, with success coming from combining safety, excitement, financial accessibility, novelty and active participation without much required skill (Buckley 2009). These characteristics of whitewater rafting

allow it to provide a rich example of how tourism can create opportunities for personal change.

Case study: whitewater rafting on the Pacuare River

The Pacuare River is not only relevant for its scenic beauty, biodiversity and world-class rafting, but also for its continuous threat of hydropower development. Our research involved whitewater rafting tours along a 26-kilometer commercial section of this river with rapids ranging from Class I to IV. Tours begin along a cobbled sandbar at the entrance of narrow canyons, float by a myriad of creeks and waterfalls, pass through the dense Pacuare River Forest Reserve and conclude with canyon walls opening onto the Caribbean lowlands. With challenging whitewater contrasting against tranquil pools, this river encourages rafters' external and internal journeys. The Pacuare River exemplifies issues between tourism, conservation and development as a venue that supports many jobs and thousands of tourist experiences annually, but with predominantly international tourists arriving only with large carbon emissions. Does that mean, however, that another pristine river should be dammed for carbon neutrality at the sacrifice of biodiversity and tourism? These issues illustrate complexities surrounding rivers' value and important political and policy decisions to which tourism sustainability may be already contributing.

Recent political deliberations surrounding the Pacuare River demonstrate the contribution of ecotourism to resolve sustainability challenges and dilemmas within existing political economy and power structural constraints. In 2015, the Costa Rican government decreed a ban on hydroelectric projects equal to or exceeding 500 kilowatts for the next 25 years on the Savegre and Pacuare Rivers. The decree acknowledges the environmental, social and economic importance of the Pacuare River, particularly its role in tourism. Of specific interest for our research is that Costa Rica's President Luis Guillermo Solis approved river-protective legislation following a political process that culminated with a rafting tour on the Pacuare River on August 29, 2015. Many dedicated actors including river enthusiasts, tour guides and operators, and indigenous communities influenced the President's decision by advocating the river's value and need for conservation. These tourism actors might have acted in self-interest to protect their livelihoods and recreational resources. In fact, research elsewhere shows a mixed track record of sustainability behavior among operators and guides (e.g., whale-watching tourism, Allen et al. 2007). However, tourism actors in the Pacuare River context largely supported their positions via calls for promoting sustainability nationally, while asserting that they practice it within their operations. The Costa Rica Tourism Institute (ICT) also encourages sustainable practices and improved standards nationwide through its Certification for Sustainable Tourism program. In 2009, the National Chamber of Ecotourism (CANAECO) initiated an ongoing Climate Conscious Travel voluntary program to help offset carbon emissions of tourists' flights and other transportation, allowing operations to assume responsibility for their associated carbon production. In 2014, Rios Tropicales, a tourism company focusing on whitewater rafting, received the Tour Operators' Sustainable Tourism Award from Skål International (International Association of Travel and Tourism Professionals) for their community development and environmental conservation project along the Pacuare River.

Tourism actors negotiated with government to protect the Pacuare River and organized a two-day festival along its waters, where they invited the President to raft. The festival came just as a previous 10-year development freeze period endorsed through referendum ended, which had also prevented Pacuare River dam development. Such events highlight tourism's and tourism actors' potential in promoting sustainability change. Here, tourism actors became change agents in the process toward Pacuare River protection and their ecotourism connections conceivably empowered their activism. Providing the President with his first river rafting trip is important in that it took him out of his conventional context and offered him an embodied experience of the policies' actual repercussions. The 2015 hydropower ban did not remove the structural pressures that economic growth and climate change still pose on the river's ecology. Yet, important for global sustainability transformations, is that change processes like what has happened on the Pacuare River become more visible and widespread.

Research design

Our research design was informed by principles of experiential design (Pullman and Gross 2004) and experiential learning theories (Kolb 1984). Over a month-long period in December 2014 and January 2015, data were collected from a tourism operation's 68 rafting guests before and after 10 different full-day trips. The tourism operation was selected for its representativeness as a medium-sized company catering to both national and international tourists with a median tour price. The research period was also deliberate as a time when Costa Ricans, both professionals and students, take holiday and international visitation increases sharply (ICT 2014).

Participants were selected through convenience sampling (Veal 2006). Participation was limited to adults (18+ years old), but rafting guests could be as young as 12 years old, and 11 non-adults participated on tours during our survey process. Response rate was high with 83% ($n = 68$) among the 82 adults who rafted with the tourism operation while conducting our research. Only three participants, or 4.4%, were Costa Rican, close to the tourism operation's claimed 5% national representation on tours. Other operators within Costa Rica's rafting industry also claim this number. Importantly, our sample only includes those with disposable income to raft on one-day tours and mostly those with capacity to travel internationally, reflecting unequal power arrangements within the tourism industry and the opportunity for personal change that these powerful actors may experience. On average, tours involved two rafts, but varied from one to four, suggesting the personal attention and small-group size appropriate to providing intimate and individualized ecotourism experiences (Blamey 1997).

Research participants filled out surveys both before and after whitewater rafting. Surveys were provided in both English and Spanish to accommodate language variance. Participants could individually process and respond to all survey questions. Using surveys also helped minimize tourists' time commitment and avoided impeding the tourism operation's daily routine. Our two surveys included both closed- and open-ended questions. Multiple-choice questions provided options for what we expected to be several typical responses among tourists within the activity. For each open-ended question, individual responses were coded until three or four core emic categories surfaced.

Numerous questions were intended to explore different experiences and possible impacts of these experiences in regards to personal change. Our surveys used the label ecotours to signify the ecotourism experience. We avoided reference to sustainability within the surveys to prevent consequent bias within participant responses. By surveying guests before and immediately after, we tried to capture tourist personal changes as processes directly connected to the tourism experience. Overall, we focused our data analysis on the tourists' experiences—previous and current. We explored factors connected to personal change in tourists, which may in turn be connected, although we did not test this, with processes of becoming pro-sustainability change agents.

The pre-tour survey analysis aimed to assess what influenced tourists' perception as to whether ecotourism triggered a personal change so far (dependent variable: *previous ecotour personal change*). Questions addressed six independent variables: *gender*, *ecotour frequency*, *ecotour diversity*, *interest diversity*, *other life changes* and *eco-centric affinity* (regarding tourists' environmental dispositions). To assess participant eco-centric affinity, we developed an index using their responses on nine five-point Likert-scale questions (Table 1).

The pre- *and* post-survey analysis examined what led tourists to state that the present tour experience will trigger personal change (dependent variable: *present ecotour personal change*). Questions addressed seven independent variables: *gender*, *ecotour frequency*, *rafting frequency*, *previous ecotour personal change* (pre-tour survey-dependent variable), *guide story diversity*, *life back home* (predominately outside Costa Rica due to sample) and *memorable moment*.

Descriptive statistics and logistic regressions using Stata 13 were performed on the pre- and post-tour survey data ($n = 68$). In the logistic regressions, all likelihood ratio Chi-squares had a p value <0.05, indicating that the models fit significantly better than a null model. Given that pseudo-R^2 in logistic regressions do not provide the same meaning of variance as in OLS regressions and should therefore be understood cautiously (Menard 2000; Peng et al. 2002), we also assessed other measures of goodness of fit including other R^2 indices (Cox and Snell 1989; Nagelkerke 1991) as well as area under ROC curve (AUC)—a measure of the model's discrimination ability; percent of correct classification—based on a cross-tabulation of observed versus predicted outcomes; and the Hosmer–Lemeshow test which if insignificant ($p > 0.05$) suggests the model fits well to the data (Hosmer and Lemeshow 2000).

Results

Through descriptive statistics and logistic regression models, we examined two outcome variables—*previous* and *present ecotour personal change*. For each model, we included several independent variables to explore possible factors influencing the participants we surveyed.

For *previous ecotour personal change*, we found the variety and overall amount of ecotour experience to be influential along with tourists' interests, gender and perceptions of other changes in life (Table 2). For *present ecotour personal change*, we found previous ecotour personal change and the frequency of rafting experiences to be influential, whereas tourists' self-reflection and guides were found not to be (Table 3). In this section, we begin to offer explanation as to why certain variables were significant, while others were not.

Table 1 Eco-centric affinity index

Items
I consider myself an environmentalist
Nature exists primarily for human use (inverted)
I buy environmentally friendly and local products whenever possible
I would be willing to dedicate part of my income to fund conservation efforts
When spending time outdoors, I leave the place as clean as it was originally
I turn off lights when I leave a room, turn off water when brushing my teeth, and reuse and recycle whenever possible
I often persuade others that the environment is important
One of the most important reasons to keep lakes and rivers clean is so people have a place to enjoy water sports (inverted)
I oppose any removal of wilderness areas no matter how economically beneficial their development may be

Table 2 Previous ecotour personal change—model 1

Variables	Survey questions	Model 1 results
Dependent: previous ecotour personal change	Do you think these tours (activities) changed your life/lifestyle?	Logistic regression reporting odds ratios, *z*-values in parenthesis and significant *p*-values
Gender		4.73 (2.04)**
Ecotour frequency (1—first time, 2—once before, 3—every 2–3 years, 4—1+ per year)	How often do you participate in other guided nature-based tours (ecotours)?	3.69 (1.80)*
Ecotour diversity (sum, 1–5)	What other types of guided nature-based tours (ecotours) have you done?	3.43 (2.72)***
Interest diversity (sum, 1–5)	What interested you in doing this rafting trip on the Pacuare River?	2.36 (2.22)**
Other life changes	Can you remember any other experiences that changed the way you think about the world?	28.82 (3.24)***
Eco-centric affinity index (1–5, 1—strongly agree, 5—strongly disagree)	Listed in Table 1	0.43 (−1.30)
Constant		0.0006 (−2.12)**
Goodness of fit measures		
LR chi2		41.14
Prob > chi2		0.000
Pseudo-R2		0.4606
Log-likelihood		−24.08
AUC under ROC curve		0.9098
Correctly classified		86.36%

$p < 0.1$*, $p < 0.05$**, $p < 0.01$***

Previous ecotour personal change

Previous ecotour personal change is the dependent variable for Model I ($n = 66$) with 40 participants (61%) reporting that ecotourism changed their lives. Participants' perceptions of *previous ecotour personal change* were coded, where three categories emerged during qualitative analysis: environmental connection, personal life and outdoor/recreational behavior. Environmental connection refers to participants' relationship and appreciation of the environment, including claims to awareness and behavioral changes like eco-friendly and environmentalist actions. Personal life refers to participants' change within their character and traits, including self-perception, confidence and worldview. Outdoor or recreational behavior refers to participants' focus on the ways ecotours have changed their outdoor and recreational habits, including intentions to explore, increase activity participation and adventurous attitude. Of those reporting ecotour-related personal changes, 47.5% claimed the change to be environmental

Table 3 Present ecotour personal change—model 2

Variables	Survey questions	Model 2a results	Model 2b results
Dependent: present ecotour personal change	Do you think the experience today will have a positive impact on your daily life?	Logistic regression reporting odds ratios, *z*-values in parenthesis and significant *p*-values	
Gender		1.62 (0.71)	1.88 (0.91)
Rafting Frequency (1—first time, 2—once before, 3—every 2–3 years, 4—1+per year)	How often do you go whitewater rafting?	2.05 (2.08)**	2.15 (2.17)**
Ecotour frequency (1—first time, 2—once before, 3—every 2–3 years, 4—1 + per year)	See Table 2	0.9 (−0.22)	1.05 (0.10)
Previous ecotour personal change	See Table 2	7.67 (2.78)***	6.04 (2.41)**
Life back home (sum, 1–5)	Did the tour today make you think about your life back home?	1.21 (0.24)	1.43 (0.45)
Guide story diversity (sum, 1–5)	What did your guide's personal stories add to your experience?	0.98 (−0.07)	0.98 (−0 to 08)
Memorable moment	Was there any moment on the trip today you believe was very memorable?		0.99 (–0.29)
Constant		0.13 (−1.03)	0.070 (−1.29)
Goodness of fit measures			
LR χ^2		19.54	21.47
Prob > χ^2		0.0033	0.0031
Pseudo-R^2		0.2363	0.2597
Log-likelihood		−31.58	−30.61
McFadden's r-square		0.236	0.260
Nagelkerke/Cragg & Uhler's R^2		0.365	0.395
AUC under ROC curve		0.8147	0.8201
Correctly classified		77.78%	77.78%

$p < 0.1$*, $p < 0.05$**, $p < 0.01$***

connection, 40% personal life and 37.5% outdoor/recreational behavior.

Model I found *ecotour diversity, interest diversity, other life changes* and *gender* to be significant in predicting participants' previous ecotour personal change. *Ecotour frequency* was also slightly significant ($p = 0.071$), with incremental increases in ecotour frequency leading participants to be 3.6 times more likely to find that ecotours have had a personal life-changing impact. This finding complements evidence that frequency in local outdoor activity participation is linked to enhanced environmental values (Larson et al. 2014).

As *ecotour diversity* increases, a person is incrementally 3.4 times more likely to perceive that they have had a life-changing experience. This variable was analyzed through a summative category of participant responses to a multiple-choice question about past ecotourism experience. Here, options included: hiking/trekking, wildlife viewing, sailing/fishing, climbing/mountaineering, none and other. Therefore, this diversity of previous ecotour experience summative category could range from zero (none self-reported) to five (all options self-reported) for each participant. Participants tended to have experienced various ecotours other than rafting, averaging at 2.6 types, with only one participant reporting no other previous ecotourism experience. This may arise from our inclusive definition of what constitutes an ecotour. Even so, diversity of ecotouristic experiences seems to be important in tourists' perceptions of personal change in our study. Within whitewater rafting, tourists with past experiences have been found to hold more realistic activity expectations and express higher interest in a tour's social components and natural environment interaction when compared to first timers, who generally seek novelty and adventure (Fluker and Turner 2000). Personal histories involving a variety of ecotour experiences may enable the perception of these tours' personal effects, rather than a limited ecotourism experience promoting the pursuit of immediate benefits.

Having diverse interests in the whitewater rafting tour increases the likelihood of *previous ecotour personal change*. *Interest diversity* was analyzed through a summative category of participant responses to a multiple-choice question about interests in the current rafting tour. Here, options included: risk/adventure, wanting to get outdoors, guide stories and informative talks, the water environment and other. Therefore, this *interest diversity* summative category could range from zero (none self-reported) to five (all options self-reported) for each participant. As participants incrementally claimed additional interests in the whitewater rafting tour, they became 2.36 times more likely to find they had previously experienced a life change associated with ecotourism. Diverse interests relate to the breadth of participant subjective motivations, with tourist motivations being a common subject within tourism studies (e.g., Ballantyne and Packer 2011). If participants claim diverse interests in the present tour, they may have also experienced varied interests in past tourism activities. This result suggests that existing subjective motivations may be a key factor in explaining life changes.

We were initially interested in exploring how participants' eco-centric affinity would predict ecotourism-associated life changes. Emotional affinity toward nature has been linked to individuals' past and present natural environment experiences (Kals et al. 1999). Interestingly, this *eco-centric affinity index* did not play a significant role in our model. This result may suggest inadequate selection of questions within our study. Or, the result may suggest the reality that ecotourists (and those open to ecotourism) already possess relatively high levels of eco-centric affinity. Our index suggests this tendency, with a 3.93 mean out of a 4.78 max (and a standard deviation of ± 0.57).

For people having experienced other personal changes, odds of finding that they have had a life-changing ecotourism experience is 28 times that of someone who did not have those. Participants' explanations of *other life changes* within an open-ended follow-up question ("If yes, can you explain the experiences?") were coded into three categories during qualitative analysis: traveling, other outdoor experiences and unique/new experiences. Traveling refers to participants' international experiences, including studying, working and living abroad. Other outdoor experiences refer to participants' claims to the outdoors impacting their life, including particular trips and outdoor education. Unique or new experiences refer to participants' claims that an experience changed them because it was particularly different, including new cultures and environments. Of those claiming *other life changes*, 60% perceived the changes to be from traveling, 40% from other outdoor experiences and 42% from unique/new experiences. Nisbet and others (2009) found that spending more time in nature was an important trait among individuals with higher nature relatedness. Our research goes beyond this point, however, to suggest that perceptions of change from outdoors, traveling and unique experiences may promote ecotours to also be understood as life changing. Interestingly, when we account for gender, men seem to drive the significance of "other outdoor experiences" ($p = 0.017$, Pearson $\chi^2 = 5.7287$), whereas women are linked to "traveling" ($p = 0.065$, Pearson $\chi^2 = 3.4116$).

Lastly, *gender* was significant in predicting ecotourism-associated personal changes, with women 4.73 times more likely to self-report changes from such experiences. So women are more likely than men to find that ecotours have a life-changing impact. This result was unexpected, although Powell and others (2009) also found women to be more likely to have intentions of changing their future environmental behavior after rafting the Grand Canyon.

Present ecotour personal change

Present ecotour personal change is the dependent variable for Model IIa ($n = 63$) with 40 participants (63.5%) reporting that the whitewater rafting tour triggered a personal change. Participants' perceptions of *present ecotour personal change* were coded, where four exclusive categories emerged during qualitative analysis: attitude change, environmental appreciation, outdoors/recreation commitment and family relationship. Attitude change refers to participants' claims of attitudinal shifts like positivity, relaxation and fulfillment. Environmental appreciation refers to participants' claims to an enhanced appreciation for nature, including commitments to its protection. Outdoors and recreation commitment refers to participants' claims to future change in their outdoor and recreational behavior, including increased dedication to adventure, tourism, exercise and the outdoors. Family relationship refers to when the main claim by participants was a sense of familial bond and desire to spend time with relatives. Of those claiming *present ecotour personal change*, 35% perceived the impact to be attitude change, 17.5% environmental connection, 32.5% to be outdoors/recreation commitment, 12.5% family relations, and one participant offering no explanation. Importantly, our two dependent variables are not highly correlated ($n = 65$, 0.3979).

Frequency of previous rafting experiences significantly predicted *present ecotour personal change*. As *rafting frequency* increases, a person is incrementally twice more likely to state that tours will trigger a personal change. *Rafting frequency* is not correlated with *ecotour frequency* ($n = 68$, -0.1324). Interestingly in Model IIa, *ecotour frequency* is not significant, whereas in Model I it was slightly significant. Participants' frequency of rafting is not directly connected with tourist activities and instead relates to how often they rafted whether via tourism or recreation.

This frequency explains participants' history of similar experience, and it is intriguing that more frequent similar experiences led participants to more likely report that the present tour impacted their daily life.

Participants perceiving a *previous ecotour personal change* were 7.67 times more likely to find that the present tour will positively impact their daily life post-tour. As mentioned above, these variables are not highly correlated. This result relates to our conceptual model in that tourism experiences are part of a process, where past experiences and our perceptions of them can influence present experiences. Past perceptions of change potentially lead to openness and higher tendencies toward experiencing the present as impactful. Similarly, Gelter (2010) theorized tourism experiences to involve tourists' pre- and post-experience with tourist sustainability-oriented change as the ultimate goal of such experiences.

Model IIa also found that guides' influence, measured through *guide story diversity*, was not significant in predicting *present ecotour personal change*. *Guide story diversity* was selected as a metric for guide influence as stories relate to interpretation and thereby the tourist experience (Moscardo 2015). Most participants claimed guides' stories enhanced their experience, where only five participants claimed their guide told no stories. This variable was analyzed through a summative category of participant responses of perceived benefits from various guide stories: entertainment, comfort, river understanding, outdoors connection and activity engagement. This guide story summative category could range from zero (no benefits self-reported) to five (all benefits self-reported) for each participant. Our study's results suggesting guides' influence as negligible to the tourism experience contradict prevalent ideas in the field (e.g., Curtin 2010; Weiler and Ham 2001). Here, there may be several factors influencing the result including: guide quality, tour length and survey questions. Also, simply because guides are found to be not significant in predicting present tour impact, is not to say guides do not facilitate experiences, provide access and enable activity participation for tourists.

Other attributes were also found to be not significant within Model IIa. First, participants' thoughts of *life back home* were not significant in predicting *present ecotour personal change*. This question attempted to explore tourists' reflection during the tourism activity, where "back home" predominately refers to locations outside Costa Rica. When these variables were isolated, however, *life back home* shows a significant correlation with *present ecotour personal change* ($n = 64$, $p = 0.0225$, Pearson $\chi^2 = 4.9922$). Others have found "reflective engagement" to be important within impactful tourist experiences (Ballantyne et al. 2011; Walker and Moscardo 2014). However, our results are inconclusive regarding the tourist reflection connection to tourism impact. Second, with tourists' perceptions of the ecotour's *memorable moment* added in Model IIb ($n = 63$), we found the variable to also be not significant. This variable was intended to explore tourists' engagement within the activity and the relevance of memorable experiences. Ballantyne et al. (2011) found that within wildlife tourism, tourists' memories relate to sensory engagement, emotional connection, reflection and behavioral response. Tourists' subjective engagement within tourism experiences is important for tourists to perceive such experiences as authentic and impactful (Xue et al. 2014). The perception of authentic experiences may also be important to tourists' transformed identities and self-change (Noy 2004).

Discussion

The goal of this research was to explore the relationship between tourism experience and pro-sustainability agency. Our empirical research is purely exploratory and, therefore, our results should be considered a first attempt and speculative. We built a conceptual model of the tourism experience and personal change, which we have analyzed through two dependent outcome variables—*previous* and *present ecotour personal change*. Our model relates to ecotourists' developmental processes containing interactions between the past, present and future that are mediated through the tourism experience. *Previous ecotour personal change* explored the past through previous engagements, while *present ecotour personal change* explored the present and future. Analysis from our logistic regression models offers four main findings relevant to the relationship between tourism and pro-sustainability agency. We also discuss important limitations of our research and offer recommendations for future investigations.

Findings and tourism design implications

First, findings suggest the importance of subjective internal processes and tendencies, over external environmental factors, in influencing perceptions of ecotour personal change and impact. This arises from both Model I and Model II suggesting the importance of tourists' predispositions to change. Within Model I, this was discovered through the high significance of *other life changes* in influencing previous ecotour personal change. Within Model II, this was discovered through the significance of *previous ecotour personal change* in influencing present ecotour personal change, as well as the lack of significance of variables like *guide story diversity, life back home* and *memorable moment*.

Second, findings suggest complexities in both the tourists' ability to connect tourism experiences with non-touristic off-site experiences and the guides' influence in the tourism experience. These findings have implications for our conceptual model as well as the design of tourism. *Life back home*, a variable used to explore tourists' reflective experiences, was found to be not significant within Model IIa but significant through independent Chi-square analysis. Self-reflection on broader life experience may be key for tourists to avoid living tourist experiences in isolation, disconnected from other life experiences. Consequently, an updated conceptual model of the tourist experience could include interactions with life off-site of tourism activities. Another development in the conceptual model may be minimizing the direct role that guides play in the tourist experience and subsequent personal changes given that *guide story diversity* was not a significant variable. Even with a minimized role, however, it is important to consider the many services guides provide as discussed in this paper. We were only able to assess that tourists' self-reported *present ecotour personal change* was not significantly influenced by *guide story diversity*. We were unable, however, to determine tourists' perception of the role of other guide-provided services. Further research into the guides' role in tourist experience and personal change is needed.

Third, findings suggest the importance of *ecotour diversity* over *ecotour frequency* in influencing ecotour personal change. Finding that diversity of ecotour experience was significant in influencing participants' claims to tourism-associated personal change indicates that tourists carry their scope of past experience with them on present activities. *Ecotour frequency* may be less important than a well-rounded tourist experience. Through a diversity of experiences, tourists may be able to forge stronger and broader connections with the world and may be more likely to recognize connections among their various tourism experiences, with such experiences potentially supporting personal change. This implies tourism activities should be considered as more than one-off trips, and instead as parts to portfolios of coherently linked experiences, with implications for understanding traveling and its broader personal as well as environmental impacts.

Fourth, findings suggest *gender* to be important in explaining the role of different activities in influencing ecotour personal change. We found that women are more likely to claim tourism-associated life change. Gender also influenced participants' perceptions of what experiences offered *other life changes*, with women influenced through travel and men through other outdoor experiences. The gender difference in perceptions of personal change could be important to how the tourism sector accommodates men versus women. Gender may also be important to examine within the broader development of pro-sustainability agency.

This article offers new understandings of the tourist experience and its connections to personal change with practical implications for tourism design and tourism actors' responsibility (Table 4). One insight suggests integrating previous tour and non-touristic experiences into tourism activities, allowing experiences to cumulate into personal change. Tourism operators may incorporate approaches that extend the resources available to tourists during and after participation (Ballantyne and Packer 2011), including web-based technology to promote tourists' future visitation and diverse emotional experiences with nature (Wheaton et al. 2016). Connecting with tourists' broader existence hinges on leveraging the 'high' they likely experience during and immediately after an activity. It is important to stress that pro-sustainability identity can emerge from a single experience, but is more likely from a collection of experiences lived and internalized by an individual. Our research suggests that the industry could promote tourism for sustainability transitions by encouraging tourists to sequentially participate in diverse activities along coherent threads thought to heighten pro-sustainability agency. Coalitions among tourism operations may facilitate experience diversity by integrating packages across operations, or by advertising the "next" recommended experience after participation in one of their tours. Our findings show that tourism sustainability could catalyze the emergence of networked packages and operations organized along meaningful threads of personal experiences with the larger goal (and justification) of contributing to global sustainability transitions. The synergies and potential benefits of such network-based and mutualistic operations could themselves constitute an economic incentive. In addition, commission from connecting tourists to other operations and activities, as well as expectations that other collaborating operations will reciprocate, could be further financial incentives for these relationships. Lastly, our research suggests new angles from which to consider the guides' role in tourism impact, such as incorporating gender sensitivities and tourists' predispositions to influence guides' thoughtful engagement and activity interpretation. This could happen through organized training and certification of tourism actors in directed interpretation and understanding of gender preferences. Overall the tourism sector could incorporate these insights into its design to support tourists' agency within sustainability transitions.

Our recommendations for creating capacity among tourism actors to facilitate tourists' personal change processes and connect current activities to other touristic and daily-life experiences support Gelter's (2010) idea of "total experience management", where the objective is personal

Table 4 Findings significant to ecotour personal change and tourism design implications

Significant finding	Policy and design implications	Tourism actors to be involved
Influence of tourists' subjective internal processes and tendencies (over external factors)	Make the subjective dimension explicit in training, certification schemes and new interpretation models	Tourism product certifiers Tourism training providers National tourism agencies Guides and operators
Role of non-touristic and off-site experiences	Design tourism packages that include before and after trip experiences to encourage personal and social connections and action beyond the activity	Operators' marketing and/or administration departments
Importance of diversity over frequency of ecotour experience	Establish collaborative entities and incentives that encourage tourism providers to both coordinate their products, and raise tourists awareness about benefits of weaving diverse experiences	Tourism industry (inter-organization and regional collaborations) and tourists
	Create "tourism sustainability packages" combining experiences into sequences that build pro-sustainability agency	
Role of gender	Develop training and certification schemes to consider gender in tourists' activity engagement	Tourism product certifiers
	Leverage factors that may enhance personal changes among men (outdoors) and women (traveling experiences)	Tourism training providers Guides, operators

change among tourists. However, our focus on experience is still too narrow and fails to account for tourism impacts beyond tourists and their willingness and capacity to drive change. The tourism sector continues to experience rapid growth, where global international tourist arrivals increased by 4.6% to 1,186 million in 2015, and Costa Rica's increased by 5.3% to 2.66 million (UNWTO 2016). Growth in tourism affects the sector's associated greenhouse gas emissions with direct factors (travel, transportation, accommodations, activities, etc.) accounting for between 5 and 18% of total global emissions (UNEP and UNWTO 2012). McKercher and others (2010) found climate change awareness to be disconnected from willingness to change travel behaviors, implying a need for the industry to assume responsibility for these effects. Negative impacts of tourism extend to biodiversity loss, water consumption and reduced quality, pollution and waste production (UNEP and UNWTO 2012). Tourism is resource intensive with research indicating that by 2050 the sector's demands—including energy, freshwater, land and food use—will likely double due to increases in trips, distance traveled and amount of upscale tourism, even when considering efficiency gains (Gössling and Peeters 2015). Impacts and responsibilities of the tourism sector must be considered more broadly including temporal and spatial scales and the industry and consumers' roles in promoting sustainability (Saarinen 2014). Tourism change agents and pro-sustainability agency may play a fundamental role in changing tourism. However, does supporting pro-sustainability agency remain justified in a sector driven by profits? Are the tourist personal changes we find here sufficient when considering broader implications and dynamics of tourism? To enable lasting impact, tourists must carry their experiences back home or change their future behaviors when traveling, outcomes we were unable to ascertain given our research design. Dynamics of location for tourism experiences is an important consideration. Can local and regional tourism create similar, or even more influential, experiences than international tourism? The role of location in tourism experiences, relative to tourists' broader experiences, should be further considered. We also recognize that tourists' ability to play an ambassador role has had limited results (Eijgelaar et al. 2010).

Even with tourists willing to change and promote sustainability, it remains unclear whether the tourism sector would engage in processes that may increase awareness regarding the unsustainability of tourism. In Costa Rica, tourism operations have been shown to be open to change and have even taken steps toward sustainability (e.g., Rios Tropicales' project mentioned above). Our findings and design implications provide opportunities for tourism actors to tap into a tourism niche, increase guides' role in tour impact and improve coalitions that self-promote the industry regionally. Moving in the directions we suggest is not a panacea but it offers a new perspective and intervention points for tourism to help reconcile the many paradoxes that currently embody the sector and become more relevant in the twenty-first century, which will likely be marked with transitions toward sustainability.

Limitations and future research directions

There are several limitations we recognize within the study. Generally, our research is limited as a single case

and small non-probability sample. Specifically, our research is limited because it measures tourists' self-reported, and not actual, changes pre- and post-tour. Additionally, we chose to use quantitative research methods to begin understanding tourists' role within tourism for sustainability transitions. This decision was made consciously, but led to limitations in our results, especially those connected with sustainability change agents. Our choice offers preliminary results and suggests the potential of qualitative methods for future research. For instance, we believe qualitative research methods, such as in-depth interviews with tourism actors and longtime tourists, may provide greater opportunities to assess the sustainability change agent concept. We also believe that comparative studies exploring the impacts of various types of ecotourism—or even luxury or mass-tourism—on the tourist experience may provide evidence into key experiential elements that lead to tourist change.

A final and major limitation of our study is the environmental focus by researching ecotourism that makes it difficult to draw connections to broader sustainability change (social justice, gender equality, livelihood opportunities, etc.). This emerged from participants' responses to *previous* and *present ecotour personal change* highlighting tourists' ecological perspectives, in ways not clearly linked to sustainability transitions and pro-sustainability agency. For both *previous* and *present ecotour personal change*, participants' responses categorized as claimed changes in environmental connection were 47.5% of the total 61% of participants reporting a *previous ecotour personal change*, or 29%, and 17.5% of the total 63.5% of participants reporting a *present ecotour personal change*, or 11%. The environmental connection category may be argued as most closely linked to sustainability agency and shows limited connections to our participants' self-reported ecotour change. Can ecotourism only contribute to pro-environmental behavior, or can it indeed contribute to pro-sustainability agency? Is the promotion of broader sustainability change related to personal changes in human-nature relations? To start making the connections between ecotourism experiences and broader change (e.g., leadership needed to promote social justice), we chose whitewater rafting and tourists' perceptions of personal change. Given suggestions from our research on tourism-associated personal change, we support a research agenda to enhance the connections between tourism and sustainability transitions.

Conclusion

The relevance of this research for the emerging field of tourism sustainability, and its application to sustainability transitions, is that tourists may change via tourism experiences, and tourism actors could facilitate such change by designing activities that promote pro-sustainability agency. Although our research offers limited connections to pro-sustainability agency, the value of this research is to (1) offer a new way to value tourism and (2) begin to coalesce the relationship between tourism experience, personal change and pro-sustainability agency. While change agents are a key factor in sustainability transitions, little is known about how transformative forms of agency emerge, or could be promoted, in people's daily routine or elsewhere. Our exploratory research suggests that tourists' motivations and dispositions to change, and tourism experience alignment (e.g., human–nature interactions) with participants' developmental processes may all be important for tourism-associated personal change. Experience diversity, integration with off-site experiences and attending gender differences were also revealed in our study as key factors affecting change among tourists. Tourism may be designed to influence tourists more if the industry begins developing new interpretation models and training certifications, incorporating tools to extend the experience, and establishing tourism operation coalitions to encourage tourists to pursue a diversity of activities. This offers an opportunity for the tourism industry to contribute to broader sustainability transitions, while sustainable tourism remains important for its role in managing impacts of the sector locally.

There exist many avenues to explore the potential of tourism for sustainability transitions, and we simply chose to focus on the tourist and their experiences. Tourism's transformational power is critical to our claims. We have attempted to respond to Reisinger's (2013) call for further developments in connecting transformational tourism and sustainability. We believe tourism sustainability is a field to research empirically, and this paper attempts to open doors for possible further investigations. Our conceptual entry points into the field are (1) tourists as change agents for sustainability and (2) the river as a powerful locale. Due to research design, we were unable to empirically explore tourists' pro-sustainability agency back home and the specific influence of river tourism in comparison with other types of tourism. Yet, our preliminary results suggest a number of recommendations to design tourism activities as leverage points for larger sustainability transitions via personal change in tourists.

Nature-based tourism, or ecotourism, may be valuable in promoting sustainability transitions, where one avenue toward change is tourists developing pro-sustainability agency. After all, sustainability requires social–ecological transformations that will not happen spontaneously but as a result of human agents pushing for change (Manuel-Navarrete and Pelling 2015). The pro-sustainability agency introduced here is a way toward more profound societal change even though our

research focused on the environmental characteristics of tourism impacts (ecotourism, eco-centric affinity, etc.). The human–environment relationship is a personal and embodied connection (Cooke et al. 2016), where the power of tourism may be as an activity and experience conducive to reconnecting humans with nature that can act as a profound intervention for sustainability transitions (Abson et al. 2017). Our discussion of personal change and pro-sustainability agency must be complemented with research into how institutional and structural changes within tourism can also drive sustainability. The deliberate design of tourism products to influence deeper changes for sustainability may be a powerful solutions-oriented approach.

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