



RESEARCH LETTER



Travel-induced learning: a validation of the sustainability insight scale

Michael L. Lengjeza^a, Carter A. Hunt ^b and Janet K. Swim ^a

^aDepartment of Psychology, The Pennsylvania State University, University Park, PA, USA; ^bDepartment of Recreation, Park, and Tourism Management, and Anthropology, The Pennsylvania State University, University Park, PA, USA

ABSTRACT

With 2017 as the UN's International Year of Sustainable Tourism for Development and the role of tourism in the UN Sustainable Development Goals, ensuring that tourism be designed and managed for sustainability is more imperative than ever. Here we present the Sustainability Insight Scale (SIS), which offers scholars and practitioners a practical tool for assessing sustainability-specific learning. A strong link between travel and learning is well documented, and recent research documents positive links between travel and pro-environmental outcomes. Integrating these writings with scholarship on sustainability meta-competencies, we focus attention on four elements of sustainability insights: *temporal thinking*, *interpersonal literacy*, *systems thinking*, and *personal connection to life on the planet*. When acquired during travel, these insights are likely important precursors to post-trip pro-environmental behavioural change. With sustainable tourism on the 2030 Agenda for Sustainable Development, the SIS will be of interest to tourism researchers, planners, and policy makers seeking to promote sustainability education.

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With the UN's declaration of 2017 as the International Year of Sustainable Tourism for Development, and the role of tourism in the UN Sustainable Development Goals, ensuring that tourism be designed and managed for sustainability is more imperative than ever. Here we are specifically interested in sustainability-specific meta-competencies as possible tourism learning outcomes. Meta-competencies have emerged as a central theme in sustainability education. In their review of sustainability education literature, Engle, Barsom, Vandenberg, Sterner, and Alter (2017) defined meta-competencies as broad and overarching knowledge-sets and skill-sets that allow the unification and application of more specific skills and knowledge germane to sustainability. We provide a quantitative measure – the Sustainability Insight Scale (SIS) – that offers tourism scholars a practical tool for assessing sustainability-specific learning.

The scale assesses four elements of sustainability insights: temporal thinking, interpersonal literacy, systems thinking, and personal connection to life on the planet, with the first three derived from (Engle et al., 2017). *Temporal thinking* is an understanding of the importance of projecting cause-and-effect relationships into the future. We focus on future orientation because of its relation to environmental attitudes and behaviours (Milfont, Wilson, & Diniz, 2012). *Interpersonal literacy* is an understanding of the importance of engagement and cooperation among a range of diverse groups and individuals to provide a livable world for all life on the planet. *Systems thinking* is the recognition of a complex set of interrelations between members of a system. Systems thinking is associated with

sustainability-related opinions such as climate change risk perception and policy support (Lezak & Thibodeau, 2016). In addition to the three meta-competencies drawn from Engle and colleagues' review, we add *personal connection to life on the planet* which can be considered a measure of identification of relationships with nature and other people. Developing connections to others is central in environmental education and important for developing concern about environmental justice (Frantz & Mayer, 2014).

We tested the SIS in two samples of undergraduates from the same university who travelled during summer break (Sample 1; S1) or spring break (Sample 2; S2). Noting concerns about the representativeness of US student spring break travel culture (e.g. Sönmez et al., 2006), we chose two distinct samples to enable a test of replicability across both travel periods. Respondents recruited in fall 2016 reflected on their travel experiences of one week or more within the preceding six months ($N = 372$). Respondents recruited in spring 2016 reflected on travel experiences over spring break ($N = 193$), two weeks earlier. There was no selection as to type of travel experience, increasing the potential applicability of the measure to a wide range of contexts. Participants rated sustainability insights on seven-point scales from 'Strongly Disagree' (-3) to 'Strongly Agree' (3). Initially, six items assessed *temporal thinking*, four items assessed *interpersonal and ethical literacy*, four items assessed *systems thinking*, and nine items assessed *personal connection to life on the planet*.

S1 data guided subscale development. Eigenvalues and scree plots from exploratory factor analyses revealed one-factor structures for three of four competency subscales. The exception was 'personal connection to life on the planet'. Promax rotation indicated that items relating to animals loaded on one factor and items relating to people loaded on another. As a result, we treated personal connection to animals and personal connection to people as separate subscales. Two items connecting human and environmental health split-loaded and were dropped. This yielded five subscales. Hayes's (2005) alpha max programme was used to select three items from each subscale to provide a more user-friendly scale. Strong reliabilities for selected items were replicated in S2. These items were used in subsequent analyses. Confirmatory factor analyses for S1 compared two different models using robust maximum likelihood estimation with Satorra-Bentler corrections (MLM in *lavaan*). The baseline model was a one-factor solution $\chi^2(90) = 940.76$, $p < .001$, CFI = 0.67, RMSEA = .21. The five-factor model representing the five subscales fit better than the baseline model and had adequate fit, $\chi^2(80) = 193.83$, $p < .001$, CFI = 0.96, RMSEA = 0.08. The fit for the five-factor model in S2 was similar to that found in S1, $\chi^2(80) = 129.14$, $p < .001$, CFI = 0.97, RMSEA = 0.07, illustrating the same factor structure across both spring and summer travel (Table 1).

Convergent validity was tested with associations between the total scale and other measures in the survey. We created a composite score by averaging means for each subscale and used this measure in our tests. Respondents in S1 completed Schultz's (2002) single item measure of connectedness to nature ($M = 3.38$, $SD = 1.06$). They also indicated whether they spent time in wilderness areas (national and state parks, private reserves, 48%) or went to a cultural or natural history museum (25%), and whether they interacted with educators (guides, tour operators, scientists, and cultural experts; rated from '0% of time' to '100% of time', $\alpha = .66$; 45% indicated 10% or more). Demonstrating convergent validity, SIS scores in S1 were positively associated with connectedness to nature, $r(370) = .25$, spending time in wilderness areas, $r(370) = .22$, visiting a cultural history museum, $r(370) = .15$, visiting a natural history museum, $r(370) = .17$, and interaction with educators, $r(370) = .21$. In S2, SIS scores were positively associated with whether the trip was a service or educational trip (6%), $r(191) = .26$, ($ps < .01$).¹

Conclusions

A strong link between travel and learning is well documented (see Stone & Petrick, 2013). Recent research documents positive links between nature-based tourism, for example, and pro-environmental attitudes, motivations, and behaviours (see Ardoin, Wheaton, Bowers, Hunt, & Durham, 2015). Integrating these writings with emerging scholarship on sustainability learning and meta-

Table 1. Descriptive statistics and confirmatory factor analyses for sustainable learning objectives with a five-factor structure for Sample 1 (S1) and Sample 2 (S2).

	Mean (SD)*		Alpha		Loading (SE)	
	S1	S2	S1	S2	S1	S2
<i>Sustainability Insights total score</i>	0.08 (1.25)	−0.25 (1.25)	.93	.94		
<i>Time</i>	0.04 (1.54)	−0.03 (1.57)	.91	.92		
This trip helped me see how actions we do today can have profound consequences for future generations.	0.10 (1.70)	0.07 (1.68)			.96 (0.06)	.93 (0.08)
This trip helped me see how actions can have profound unintended consequences for future generations.	−0.03 (1.63)	0.00 (1.69)			.97 (0.06)	.97 (0.08)
This trip made me think about the importance of long-term planning for the health of people and/or the planet.	0.03 (1.68)	−0.16 (1.69)			.75 (0.08)	.80 (0.10)
<i>Literacy</i>	0.18 (1.55)	−0.07 (1.54)	.86	.87		
This trip helped me understand the importance that people with diverse backgrounds, values and motivations work together to make the world a more livable place for animals.	0.15 (1.79)	−0.10 (1.76)			.88 (0.06)	.89 (0.08)
This trip helped me understand the importance that people with diverse backgrounds, values and motivations work together to make the world a more livable place for people.	0.63 (1.74)	0.40 (1.76)			.80 (0.08)	.78 (0.10)
On this trip, I saw the importance of the ability to negotiate among people with different interest in using and protecting natural resources.	−0.26 (1.74)	−0.52 (1.64)			.79 (0.07)	.84 (0.09)
<i>Systems thinking</i>	−0.07 (1.60)	−0.44 (1.54)	.88	.91		
I gained insights into the complex relation among local, national, and global actions.	0.17 (1.84)	−0.32 (1.70)			.87 (0.07)	.91 (0.08)
I gained insights into the interconnections between economic, social, and environmental health and well-being.	0.06 (1.79)	−0.36 (1.63)			.88 (0.07)	.93 (0.08)
I gained insights into the connections between different fields of study (e.g. history, physical science, social science, arts).	−0.45 (1.71)	−0.62 (1.68)			.77 (0.08)	.80 (0.10)
<i>Connection to animals</i>	−0.04 (1.64)	−0.61 (1.60)	.88	.92		
I felt a sense of connection between myself and wild animals.	−0.29 (1.82)	−0.84 (1.67)			.91 (0.06)	.91 (0.08)
I felt a sense of connection between myself and nature.	0.50 (1.86)	−0.24 (1.83)			.75 (0.08)	.82 (0.09)
My empathy for the needs of animals was increased by this trip.	−0.31 (1.80)	−0.76 (1.69)			.87 (0.07)	.94 (0.08)
<i>Connection to people</i>	0.28 (1.48)	−0.10 (1.50)	.87	.89		
I gained a stronger sense of the connection between my actions and the well-being of people in other places.	0.29 (1.70)	−0.11 (1.67)			.92 (0.06)	.89 (0.09)
I gained a strong sense of the consequences of the well-being of others on my health and well-being.	0.01 (1.66)	−0.28 (1.62)			.89 (0.09)	.93 (0.08)
My empathy for the needs of other people was increased by this trip.	0.53 (1.62)	0.11 (1.68)			.70 (0.09)	.79 (0.10)

Note: The scale for each item ranged from −3 to +3.

*Sustainability insights were stronger in S1 than S2 as illustrated by sample differences on the total scale, system thinking, personal connections with animals and people ($p < .05$), and marginally significant differences on Literacy ($p = .07$), potentially due the uniqueness of spring break travel (Sönmez et al., 2006).

competencies (e.g. Engle et al., 2017), here we attend to sustainability insights as worthwhile travel-related learning outcomes. The factor structure, reliability and validity tests confirm the strength of the measure. Further research is needed to confirm its generalizability and usefulness across contexts and tourists. We share the SIS because we believe it will ultimately prove useful to those who wish to assess learning outcomes, for example, due to different travel contexts and educational programmes.

Insights acquired during travel are likely important precursors to post-trip pro-environmental behavioural change. With sustainable tourism on the 2030 Agenda for Sustainable Development, this quantitative tool will be of interest to tourism researchers, planners, and policy makers seeking to offer sustainability education and promote sustainable post-trip traveller outcomes.

Note

1. The other measures were not included in S2. Convergent validity was found for the subscales in S1 and S2 with the exception that going to cultural or history museums was negatively associated with connection to animals and not significantly correlated with connection to people.

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ORCID

Carter Hunt  <http://orcid.org/0000-0001-6319-8171>

Janet K. Swim  <http://orcid.org/0000-0002-3279-1308>

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