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Home and away: cross-contextual consistency in tourists' pro-environmental behavior

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ABSTRACT

Domestic and tourism pro-environment behaviors (PEBs) are often found to be related. While pro-environmental behavior in the domestic context is well-studied, virtually no research has examined consistency in PEBs across domestic and tourism contexts. Here, we examined potential consistency and spillover effects between PEBs in domestic and tourism contexts using at 717-participant questionnaire study dataset, analyzed using Partial Least Squares Structural Equation modeling (PLS-SEM). We also considered potential mediators and moderators of these relationships. The results show significant positive relationships between domestic PEBs and tourism PEBs, with environmental attachment and pro-environmental identity positively related, and moral licensing beliefs negatively related, to consistency between PEBs in both contexts. Pro-environmental identity and moral licensing beliefs were found to partly mediate the association between PEBs in both contexts, whereas environmental attachment had a positive moderating effect. We discuss the implications of these results for strengthening positive relationships between domestic and tourism PEBs, and thus fostering cross-contextual spillover.

Introduction

Environmental problems, such as global climate change, are worsening (IPCC, 2014; Melillo et al., 2014). Traditionally, governments are accountable for addressing these issues (Barr et al., 2010). However, while more significant behavioral changes will be required to avoid the worst effects of climate change (CCC, 2019), research shows that individual behavior changes can significantly reduce consumption of natural resources and greenhouse gas emissions (Margetts & Kashima, 2017; Truelove et al., 2014). For instance, even small-scale changes in individual behavior in the United States could lead to a 7% reduction in US carbon emissions (Dietz et al., 2009).

Tourism has significant and growing impacts on the environment (Buckley, 2012). According to United Nations World Tourism Organization (2018), international tourist arrivals reached 1,322 million in 2017. Tourism activities may raise money for national development, but tourism activities may also harm the environment; therefore, attention should be given to the environmental impacts of tourism. It is clear that the adoption of an environmentally-friendly lifestyle by

individuals has profound significance for environmental protection (Barr et al., 2011; Bratanova et al., 2012; Stern, 2000) and that change in tourist behaviors is likely to be particularly impactful.

Pro-environmental behavior (PEB) refers to the behaviors of individuals or groups that promote the sustainability of natural resources and environmental protection (Ramkissoon et al., 2013). Recently, research has identified the potential for PEB spillover: the adoption of one PEB leading to the adoption of one or more other PEBs (Evans et al., 2013; Ha & Kwon, 2016; Lanzini & Thøgersen, 2014; Thøgersen & Crompton, 2009; Truelove et al., 2014; Whitmarsh & O'Neill, 2010). For example, saving energy at home might increase the likelihood of also recycling at home ("behavioral spillover"); or saving energy at home might increase energy saving at work ("contextual spillover"). Previous research has also shown that PEBs are often consistent with one another (Thøgersen & Olander, 2006; Whitmarsh & O'Neill, 2010). Similar behaviors are often positively correlated (Berger, 1997; Maiteny, 2002; Thøgersen, 1999) with some negative correlations (Diekmann & Preisendorfer, 1998; Klöckner et al., 2013; Thøgersen & Olander, 2003). Much of this research has focused on exploring consistency and spillover in a single context such as either within the home or the workplace (Nash et al., 2017; Truelove et al., 2014), while the fact that PEBs in a certain situation (e.g. home) may have positive or negative effects on those of different contexts (e.g. holiday) has been neglected (Thøgersen & Olander, 2003; Whitmarsh & O'Neill, 2010). Among the few studies of contextual PEB spillover, most have considered only spillover between home and work contexts, while spillover to a tourism context offers the potential to address environmentally impactful mobility and consumption behaviors that occur with recreational travel (Han et al., 2018).

Previous research has proposed mediating factors for behavioral spillover, among which moral licensing beliefs and pro-environmental identity are important mediators within contexts such as the workplace and the home (Nash et al., 2017). However, whether these mediators also apply to spillover between contexts has received less consideration (Verfuerth et al., 2019).

As tourism becomes a central element of developed lifestyles, with associated environmental impacts, it becomes critical to understand tourism PEBs: their origins and how they can be encouraged and whether tourists carry their good environmental practices on holiday with them. Analysis by Barr et al. (2010) indicates that tourists may pay attention only to their own needs without considering environmental issues, but it remains less clear whether this is related to what tourists do at home. Another important consideration is that most research on behavioral spillovers centers on developed countries; developing countries, such as China, are facing more severe environmental problems, as well fast-increasing levels of mobility, consumption and tourism.

The current study explores consistency and potential spillover of PEBs between home and tourism contexts. Our research objectives included exploring: (a) whether cross-contextual consistency effects of PEB may exist; (b) the mediating effects of environmental identity and moral licensing in cross-contextual PEB consistency; and (c) whether environmental attachment *moderates* the direct association between domestic PEBs and tourism PEBs.

Literature review

Pro-environmental behavior

While definitions of PEB vary, broadly they are understood to entail reducing negative environmental impacts caused by individual behavior (Kollmuss & Agyeman, 2002; Steg & Vlek, 2009). Here, we define PEB as activity conducted by individuals or groups that can promote the sustainability of natural resources and environmental protection (Ramkissoon et al., 2013). PEBs includes both "private-sphere" behaviors, e.g. green consumption and recycling, and "public-sphere" behaviors, e.g. voting and encouraging others (Stern, 2000). In this paper we consider two types

of PEB: (a) Domestic PEBs (DPEBs) and (b) Tourist PEBs (TPEBs). DPEBs are the behaviors of individuals in and around the home that bring about positive environmental effects. These include resource efficiency behaviors (e.g. purchasing energy-saving appliances), green consumption (e.g. purchasing organic food), recycling household resources (e.g. batteries), selecting environmentally-friendly transportation (e.g. bus travel) and encouraging others behave sustainably. TPEBs are tourists' behaviors (e.g. on holiday) that promote environmental protection and avoid harming natural ecosystems, including selecting environmentally-friendly travel modes and products (Lee et al., 2013). As can be seen, TPEB and DPEB are essentially the same behaviors in different contexts.

Due to the high mobility associated with tourism activities, it is unclear whether tourists would maintain PEBs when on holiday, particularly when they are out of their familiar environment and away from their normal social influences. Barr et al. (2010) argued that those who are the greenest at home might still use the least environmentally-friendly transportation when traveling and Barr and Gilg (2006) suggested that, prioritizing pleasure over environmental responsibility, tourists may be more selfish when they are traveling. A survey of mass tourists by Miller et al. (2007) found that even if tourists are engaged in environmental activities at home, they do not feel the need to protect the environment when on holiday. Consequently, whether PEBs at home can spillover to tourism PEBs deserves further discussion.

Behavioral consistency and spillover

A common finding in the PEB literature is that people are often not consistent in their PEB. For example, while they often recycle at home, they are less likely to recycle at work and on holiday (Whitmarsh et al., 2018). This is at least in part due to the various contextual drivers of PEB and contextual barriers to PEB. On the other hand, there is growing evidence that – under certain circumstances – engaging in one behavior "can affect engagement in other actions aligned with the same goal" (Nash et al., 2017, p. 2). This process of "spillover" (or "response generalization") has been explored in studies of pro-environmental, financial, health and safety behaviors (Devine et al., 2003; Nash et al., 2017). Spillover has attracted much recent attention because it implies that interventions to encourage one (targeted) pro-environmental behavior may also produce more ambitious lifestyle change beyond merely changing one target behavior (Thøgersen, 1999). Spillover, therefore, might offer a cost-effective solution to promoting sustainable lifestyles. Importantly, broader definitions of spillover do not consider a behavior change intervention necessary; changes may be self-directed or arise as a byproduct of other changes (such as when choosing to go on a diet leads to other healthy behaviors: Nash et al., 2017).

Spillover can be sub-divided according to whether increase in a PEB promotes an increase in another PEB ("positive" spillover), promotes a decrease in another PEB ("negative" spillover) or does not lead to spillover at all (Truelove et al., 2014). Hence, energy conservation could lead to more recycling (positive spillover) less recycling (negative spillover) or to no change. While spillover between PEBs within a single context (e.g. at home) has been the focus of several studies (Ha & Kwon, 2016; Lanzini & Thøgersen, 2014; Thøgersen, 1999; Truelove et al., 2014; Whitmarsh & O'Neill, 2010) and spillover across (mostly home and work) contexts has also been considered in more developed countries (Frezza et al., 2018; Littleford et al., 2014; Verfuerth et al., 2019; Whitmarsh et al., 2018), the current study provides perhaps the first investigation of cross-contextual PEB consistency and spillover in a developing country (China), focusing on domestic and tourism contexts. Since domestic PEBs are usually more frequent than tourism PEBs occur, which occur only during holidays, we began with the premise that domestic PEBs influence tourism PEBs. From previous research showing consistency between PEBs and some spillover between contexts, we began with the following hypothesis.

H1: DPEB is significantly and positively related to TPEB.

Environmental identity and its mediating effect

Various factors may mediate and moderate behavioral consistency and spillover (Berger, 1997; Cornelissen et al., 2008; Lanzini & Thøgersen, 2014; Poortinga et al., 2013; Thøgersen, 1999; Thøgersen & Noblet, 2012; Thøgersen & Olander, 2003; Truelove et al., 2014; Willis & Schor, 2012). Identity effects have received most attention and growing support as an explanation for positive spillover (Miller & Effron, 2010; Thøgersen & Crompton, 2009; Thøgersen & Noblet, 2012; Truelove et al., 2014), including spillover across contexts (Frezza et al., 2018; Verfuerth et al., 2019). It is plausible that identity plays a mediating role in positive spillover (Bem, 1967; Cornelissen et al., 2008; Poortinga et al., 2013; Whitmarsh & O'Neill, 2010). For example, Van der Werff et al. (2013) found that people who were reminded of their previous PEBs (strengthening their sense of pro-environmental identity) tended to make more pro-environmental choices than people reminded of non PEBs. Similarly, Lacasse (2016) found that labeling people as "environmentalists" lead to more PEB. Both findings are consistent with self-perception and cognitive dissonance theories (Bem, 1967; Festinger, 1957): individuals infer elements of their identity from their behavior and are driven to act consistently with that self-image; to do otherwise leads to mental discomfort. Therefore, spillover can be explained as an initial PEB enhancing pro-environmental identity, in turn motivating consistency between PEBs (Truelove et al., 2014) or in the same PEBs across contexts (Verfuerth et al., 2019). Hence, we began with the following hypothesis.

H2: Pro-environmental identity (ID) plays a mediating role between DPEB and TPEB.

H2a. DPEB is significantly and positively related to ID.

H2b. ID is significantly and positively related to TPEB.

Moral licensing beliefs and their mediating effect

Negative spillover effects have been attributed to rebound effects, a single-action bias and moral licensing effects (Mazar & Zhong, 2010; Thøgersen & Crompton, 2009; Thøgersen & Noblet, 2012; Tiefenbeck et al., 2013; Truelove et al., 2014). Among these factors, moral licensing effects have attracted most attention and support. Moral licensing beliefs refer to a belief that a previous moral action permits an immoral action, hence a single pro-environmental behavior might make some people feel that they are no longer obligated to engage in any other pro-environmental behaviors (Blanken et al., 2015; Klöckner et al., 2013; Merritt et al., 2010; Miller & Effron, 2010; Thøgersen & Olander, 2003) or that they are "licensed" to engage in environmentally harmful behaviors (Tiefenbeck et al., 2013). These individuals may remember past (simple) PEBs and use them as a pretext for avoiding more difficult PEBs (Diekmann & Preisendorfer, 1998). They may regard their PEBs as a sufficient ethical contribution (Thøgersen & Crompton, 2009) that mitigates future unethical conduct (Khan & Dhar, 2006; Mazar & Zhong, 2010); hence, a moral disclaimer (Klöckner et al., 2013; Sachdeva et al., 2009).

Moral licensing has been shown to lead to less pro-environmental behavior and less ethical conduct (Mazar & Zhong, 2010), though this effect has failed to replicate (Urban et al., 2019). Sachdeva et al. (2009) suggest an increased ethical self-concept may lead to correspondingly less ethical and more egoistic choices, reminiscent of spillover. Moral licensing beliefs have been used by several researchers as explanations for the negative spillover effects found between PEBs (e.g. Capstick et al., 2019; Kaklamanou et al., 2015). However, few studies have considered moral licensing beliefs as a mediator of PEB spillover across contexts and, hence, we began with the following hypothesis.

H3: Moral licensing beliefs (ML) play a mediating role between DPEB and TPEB.
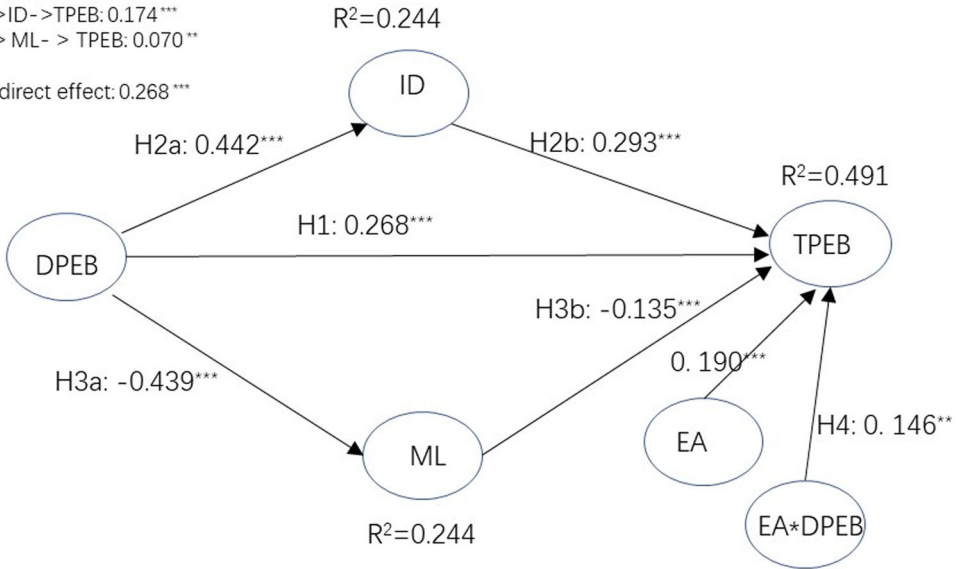
Figure 1. PLS-SEM results. Note: Domestic pro-environmental behaviors (DPEB); Tourism pro-environmental behaviors (TPEB); Moral licensing (ML); Environmental attachment (EA); Pro-environmental Identity (ID). $*p < 0.05$, $**p < 0.01$, $***p < 0.001$.

H3a. DPEB is significantly and negatively related to ML.

H3b. ML is significantly and negatively related to TPEB.

Environmental attachment and its moderating effect

Environmental attachment mainly refers to an emotional attribute of individuals whereby they appreciate the natural environment and an emotional trait that leads individuals to recognize the intrinsic value of the environment, reflecting a sense of environmental discovery, appreciation, compassion and guilt (Goudie, 2013; Hungerford et al., 1980). These emotional and cognitive elements of pro-environmental attachment are related to more fundamental pro-environmental values and – in the absence of contextual constraints – tend to be predictive of PEB (Steg et al., 2005; Stern et al. 1999). According to Kaiser et al. (1999), environmental attachment plays a vital role in consumer PEB. Meneses (2010) and Kanchanapibul et al. (2014), found evidence that emotional factors influence the PEB of tourists (cf. Ramkissoon & Mavondo, 2015) and Fox and Xu (2017) found that environmental attachment, including feelings about the natural environment, were a key factor in tourist attitudes toward environmental behavior and sustainable tourism. Conducting a meta-analysis on 37 papers, Whitburn et al. (2019) concluded people who were more connected to nature reported greater engagement in PEB. Ramkissoon et al. (2013) in a survey in an Australian national park, suggested that place attachment, in the study context, environmental attachment, was significantly associated with PEBs. Scannell and Gifford (2010) found people with greater levels of environmental attachment were more likely to engage in PEBs. Considering environmental attachment is a strong predictor for PEBs in different contexts, therefore, we propose environmental attachment – a strong prior emotional motivation – may be necessary for the spillover of PEB across contexts, given the commitment required to overcome motivational and contextual barriers (cf. Tonge et al., 2015). In other words, people with higher EA might make more effort to commit themselves to act pro-environmentally across contexts. Hence, we began with the following hypothesis.

Table 1. Sample profile.

Profiles		Percentage (%)	Profiles		Percentage (%)
Gender	M	51.9	Occupation	Student	34.8
	F	48.1		Professional/ cultural and technical personnel	7.8
Age	16–18	6.1		Civil servant	7.1
	18–25	39		Businessman	7.5
	26–35	28.4		Other	14.1
	36–45	13.1		Soldier	1.0
	46–55	7.2		Worker	20.9
	56–65	4.2		Farmers	1.4
	More than 65	1.9		Retired	5.4
Education	Middle school or under	6.8	Monthly income	Less than RMB1550	24.9
	High School/ Vocational School	18.2		RMB 1551–3000	17.4
	College/University	62.7		RMB 3001–5000	24.8
	Master	10.6		RMB 5001–8000	23.4
	Ph.D.	1.7		RMB 8001–12,500	6.5
				More than RMB 12501	2.9

H4: The direct association between DPEB and TPEB (consistency) is moderated by EA.

Methodology

Questionnaire

This research adopts a quantitative approach with the purpose of exploring hypothesized relationships between different variables (Figure 1). A questionnaire was used for data collection. This had two parts. First, social demographic questions (such as gender, age, occupation, education, and income) were asked. These give a profile of the sample (Table 1). Second, questions on DPEB, TPEB, ID, ML and EA were asked (Please refer to Table 2). These questions were informed by the findings of previous studies. For all items, a 1–5 Likert scale was used: 1 = totally disagree, 3 = neutral, and 5 = totally agree. PEBs included both private-sphere and public-sphere behaviors; PEBs were adapted from Juvan and Dolnicar (2016) and Straughan and Roberts (1999), with DPEB and TPEB matched to facilitate comparison. When answering DEPB and TPEB questions, respondents were reminded of the relevant context using the statements "now please consider your HOLIDAY activity" and "NEXT, we will move to HOME activities" (the words "holiday" and "home" appeared in bold and capitalized text, for emphasis). ID was measured using three items derived from Whitmarsh and O'Neill (2010) and Van der Werff et al. (2013). ML was measured with five items from Capstick et al. (2019) compensatory beliefs scale. EA was measured with six items, mainly from Fox and Xu (2017) and Xu and Fox (2014).

Sampling and data collection

A pilot test was conducted among 20 tourists to verify the accuracy and interpretation of the statements. After further modification and rewording of the questionnaire, recruitment began. An on-site convenience sampling method was adopted at five different types of tourist attraction (a nature reserve, forest park, holiday resort, scenic area and cultural attraction) in Nanjing, China, in June 2017. In total, 901 questionnaires were distributed (along with a very small gift to encourage participation) and 893 were collected; a total of 717 valid questionnaires were

Table 2. Measurement and indicator loading.

Construct	Indicators	Indicator loading	Composite reliability	Average variance extracted	T value	Cronbach's α
Tourism pro-environmental behaviors (TPEB)	TPEB1: I usually buy environmentally friendly tourism products	.810	0.845	0.525	46.979 30.688 21.202	0.770
	TPEB2: I usually buy accommodation products with eco-labels	.742			32.886 17.348	
	TPEB3: I often walk instead of driving if short distance	.673				
	TPEB4: I pick up the garbage left by others	.759				
	TPEB5: I persuade others to protect the natural environment	.622				
Domestic pro-environmental behaviors (DPEB)	DPEB1: I usually buy environmentally friendly products	.799	0.918	0.692	49.369 75.166 101.795	0.889
	DPEB2: I usually buy eco-labeled products	.842			38.672 44.911	
	DPEB3: I often walk instead of driving if short distance	.878				
	DPEB4: I pick up the garbage left by others	.805				
	DPEB5: I persuade others to protect the natural environment	.834				
Moral licensing (ML)	ML1: Doing some things that are positive for the environment means I am allowed to do other things that are less environmentally-friendly	.785	0.913	0.677	37.309 45.278 49.962	0.881
	ML2: If I save electricity through switching off appliances, I am entitled to use it in other ways such as by turning up the heating	.814			40.436 66.650	
	ML3: The environmental impact of flying on holiday can be made up for by reducing one's car use at other times	.841				
	ML4: If a person has a diet that is environmentally-friendly, this compensates for any environmental harm from them burning petrol/diesel in cars	.812				
	ML5: Reducing my environmental impact at home (e.g. by recycling) helps to compensate for any environmental impacts I have at work or elsewhere	.860				
Environmental attachment (EA)	EA1: Nature is quiet	.898	0.924	0.710	107.396	0.898
	EA2: Nature is fascinating	.872			78.864	
	EA3: Nature is powerful	.831			42.985	
	EA5: I love nature very much and are very interested in natural tourist destinations	.805			41.286 36.205	
	EA6: I feel relaxed and happy in the natural environment	.803				

(*continued*)

Table 2. Continued.

Construct	Indicators	Indicator loading	Composite reliability	Average variance extracted	T value	Cronbach's α
Pro-environmental identity (ID)	**ID1:** I would describe myself as an "environmentalist"	.926	0.917	0.786	149.006	0.864
	ID2: I would not want my family or friends to think of me as someone who is concerned about environmental issues	.862			51.933 52.677	
	ID3: I think of myself as an environmentally-friendly person	.870				

Note: Sample size = 717. item "I would not want my family or friends to think of me as someone who is concerned about environmental issues" is reverse scored.

obtained, representing a 79.7% response rate. Respondents are equally distributed between males and females; ages ranged from 16 years to over 65 years, with 18–35 years the modal age group (See Table 1).

Data analysis

The data was input into SPSS v.23 and transformed and analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with Smart PLS3 software (Caldeira & Kastenholz, 2018). PLS-SEM estimates partial model structures by combining principal components analysis with ordinary least squares regressions, it is usually used as an alternative to Covariance Based SEM (CB-SEM). A CB-SEM (usually executed by Lisrel or AMOS software), is often based on covariance matrix of the data and estimates the model parameters by only considering common variance (Hair et al., 2019; Jöreskog, 1973). In contrast, PLS-SEM is a variance-based SEM technique, as it accounts for the total variance and uses the total variance to estimate parameters (Hair et al., 2019). PLS allows researcher to estimate complex models without imposing distributional assumptions on the data (Chin, 1998) and is specifically used in testing path model hypotheses in an exploratory manner (Nitzl et al., 2016; Hair et al., 2019). It has been extensively used in a wide variety of fields including tourism and hospitality, marketing and management studies (Ali et al., 2018; Han et al., 2018; Nitzl, 2016). Hair et al. (2014) suggested a two-step process to ensure the validity and reliability of PLS-SEM. First, evaluate the measurement (outer) model, and the relationship between the constructs and the associated indicators; then evaluate the structural (inner) model and analyze the hypothetical relationship between the constructs in the theoretical model (Caldeira & Kastenholz, 2018). Each of the various hypothetical relationships is associated with a corresponding causal path associated with each pair of structures in the structural model (Henseler et al., 2009). Standardized path coefficients and significance levels provide evidence of the quality of the inner model, where t values are obtained through a bootstrap procedure (5000 samples) (Caldeira & Kastenholz, 2018).

Results

Validity and reliability testing

As suggested by Hair et al. (2018), examination was made of indicator reliability, internal consistency reliability and convergent validity (Table 2). For indicator reliability, all loadings were above the cutoff point of 0.6 except one item in the environmental attachment scale: I have a sense of awe and oneness with nature; therefore, it was deleted. For internal consistency reliability,

composite reliability, also termed Dillon-Golstein's rho, exceeded 0.7 for all constructs. For convergent validity, values of the average variance extracted were well above 0.5. Furthermore, discriminant validity of the constructs was confirmed using the criteria of Fornell and Larcker (1981): in all cases, the AVE values were higher than the squared inter-correlations with other constructs. The latent variables were labeled as "DPEB (domestic pro-environmental behaviors)," "EA (environmental attachment)," "ID (pro-environmental identity)," "ML (moral licensing beliefs)" and "TPEB (tourism pro-environmental behaviors)."

Path analysis and hypotheses testing

After examining the validity and reliability of the outer model, we then assessed the estimates of the inner model. But before assessing the structural relationships, collinearity was examined to make sure it did not bias the regression results (VIF <3.0) (Hair et al., 2019). The explained variance (R^2) coefficients of the endogenous constructs were examined (Henseler et al., 2009): R^2 indicates the model's in-sample explanatory power. The R^2 values were 0.237 (DPEB), 0.362 (TPEB), 0.195 (ID), 0.192 (ML). The assessment of the value of the R^2 is highly dependent upon the research area and Hair et al. (2014) recommend that a value of 0.2 is suitable in behavior studies, so these results indicate that DPEB and TPB are appropriately explained, however, ID and ML were just at the edge but still acceptable, as indicated by others (Esfandiari et al., 2019). When EA was tested as a moderator, the R^2 of the model was improved (0.491 (TPEB), 0.244 (ID), 0.244 (ML) (see Figure 1), suggesting a better explanatory power of this model.

Main effects

The results of path analysis show DPEB is significantly associated with TPEB ($ß = 0.268$, $p = 0.000$), supporting Hypothesis 1: there was evidence to suggest that DPEB and TPEB are positively related. Associations between the antecedent variable and mediators and between mediators and the outcome variable were statistically significant: DPEB-ID ($ß = 0.442$, $p = 0.000$); ID-TPEB ($ß = 0.293$, $p = 0.000$); DPEB-ML ($ß = -0.439$, $p = 0.000$); ML-TPEB ($ß = -0.135$, $p = 0.000$). The ID associations are positive, and the ML associations are negative. Therefore, there was sufficient support for hypotheses H2a, H2b, H3a and H3b. The PLS-SEM results also show statistically significant paths between EA and DPEB ($ß = 0.486$, $p = 0.000$) and between EA and TPEB ($ß = 0.109$, $p = 0.023$). Overall, these results suggest that environmental attachment and pro-environmental identity are positively associated with PEB behavior consistency across domestic and tourism contexts while moral licensing belief is negatively associated with consistency across these contexts (i.e. it is associated with inconsistency across contexts).

Mediating effects of identity and moral licensing beliefs

Next, we tested the mediation effect of two factors (identity and moral licensing beliefs) using Smart PLS3.0. The bootstrapped (5000 samples) results show all indirect paths to be statistically significant: DPEB-ID-TPEB ($ß = 0.174$, $p = 0.000$) and DPEB-ML-TPEB ($ß = 0.070$, $p = 0.005$), as well as the total indirect path of DPEB-TPEB ($ß = 0.268$, $p = 0.000$). As the direct path of DPEB-TPEB was also statistically significant (see Figure 1), these indirect paths evidence partial mediating effects. These results support H2 and H3: ID and ML play mediating roles in the association between DPEB and TPEB.

However, we notice the indirect effect from DPEB to TPEB through ML is positive ($ß = 0.070$), which indicates ML leads to positive spillover between DPEB and TPEBs, which is unexpected from previous literature. This is perhaps because, in this study, we adopted a survey questionnaire at a single timepoint. Strictly speaking, we measured tourists' beliefs about whether or not moral licensing is acceptable and linked it to their past DPEBs and TPEBs, rather than identifying

ML as causal in mitigating PEB in a different context. We acknowledge our correlational design as a limitation. However, it is still useful to see how ML relates to PEB consistency across different contexts; similarly, Whitmarsh and O'Neill (2010) adopted a single timepoint survey and demonstrated the influence of psychological variables (e.g. identity) on PEBs in different contexts.

Moderating effect of EA

The moderating effect of EA was conducted using a two-stage bootstrapping approach (5000 samples) with Smart PLS3 (Hair et al., 2019; Henseler & Fassott, 2010). As can be seen from Figure 1, the interaction term has a positive effect on TPEB (0.146) whereas the simple effect of EA on TPEB is 0.268. These results suggest that this relationship is 0.268 for an average level of EA. For higher levels of EA (for example, EA is increased by one standard deviation unit), the relationship between DPEB and TPEB increases by the size of the interaction term (i.e. $0.268 + 0.146 = 0.414$). For lower levels of EA (for example, EA is decreased by one standard deviation unit), the relationship between DPEB and TPEB becomes weaker ($0.268–0.146 = 0.122$). Figure 2 shows the simple slope plot to give a better understanding of the moderator analysis.

The relationship between DPEB and TPEB is positive for all three lines as indicated by their positive slope. Hence, higher levels of DPEB are associated with higher levels of TPEB. The upper line (in green) representing a higher level of the moderator EA, has a steeper slope, while the lower line (in blue) which represents a lower level of the moderator EA has a flatter slope. The simple slope plot supports our previous discussion on the positive interaction term: higher EA levels entail a stronger relationship between DPEB and TPEB, and vice-versa.

Next, in order to assess whether the interaction term is significant, we use the bootstrapping procedure in Smart PLS 3 (Chiu et al., 2012; Garcia-Machado, 2017). The analysis yields a p value of 0.003 for the path linking the interaction term and TPEB. The 95% bias-corrected bootstrap confidence interval is (0.086, 0.326), which does not include zero (Garcia-Machado, 2017); thus, we conclude the effect is significant.

A further analysis of the f^2 of the moderator is conducted, the interaction term's f^2 effect size is 0.033, according to Kenny (2016), the value indicates a medium effect.

We also used Dawson excel form to generate a two-way interaction plot (Dawson, 2014) as PLS does not support such plots (Details can be found in Appendix 1 (Supplementary material). The result is similar to PLS, confirming the above discussion on the moderating effect of EA.

Therefore, Hypothesis 4 was evidentially supported: the direct association between DPEB and TPEB was moderated by EA. Hence, individuals who show stronger domestic PEBs tend to also show stronger PEBs when on holiday to the extent that they feel a stronger attachment with the natural environment.
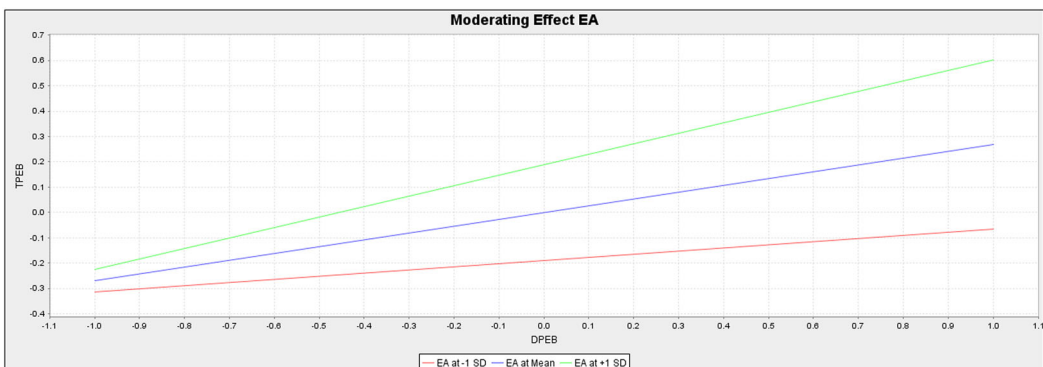

Figure 2. Simple slope analysis of EA. Note: the simple slopes of EA at +1 and −1 standard deviation.

Discussion and conclusion

General discussion

This study explored consistency of PEBs between domestic and tourism contexts, which is an under-researched area but has significant and growing impacts on the environment. We considered two potential mediating variables (pro-environmental identity and moral licensing beliefs) and a moderator (environmental attachment). These factors were evaluated using PLS-SEM, leading to the following conclusions.

1. Domestic pro-environmental behavior is positively associated with tourism pro-environmental behavior. This is consistent with domestic pro-environmental behavior leading to pro-environmental behavior whilst on holiday. Thus, it is possible that a change in these behaviors in one context may affect a change in these behaviors in the other context. This finding helps support previous research that behavioral spillover effects exist between, as well as within, contexts (Berger, 1997; De Young, 2000; Evans et al., 2013; Lanzini & Thøgersen, 2014; Littleford et al., 2014; Maiteny, 2002; Thøgersen & Crompton, 2009; Truelove et al., 2014; Verfuerth et al., 2019; Whitmarsh & O'Neill, 2010; Whitmarsh et al., 2018).
2. Domestic pro-environmental behavior and tourism pro-environmental behavior are both positively associated with pro-environmental identity and environmental attachment, and negatively associated with moral licensing beliefs. Therefore, it is possible that an increase in either pro-environmental identity or environmental attachment, or a decrease in moral licensing beliefs, might lead to consistently pro-environmental behavior between domestic and tourism contexts.
3. The association between domestic and tourism pro-environmental behaviors was partly statistically mediated: by pro-environmental identity and moral licensing beliefs. This indicates that consistency between context depends partly upon having a stronger pro-environmental identity. The findings support previous research showing positive spillover effects (Lanzini & Thøgersen, 2014; Thøgersen & Crompton, 2009; Thøgersen & Noblet, 2012) on identity. However, the unexpected indirect mediation route of DPEB through ML to TPEB is positive, while the association between DPEB and ML, and ML and TPEB are both negative, supporting previous literature that ML is negatively associated with behavioral consistency (Barr et al., 2010; Thøgersen & Crompton, 2009; Tiefenbeck et al., 2013). The unexpected indirect route here is perhaps due to the limitation that these constructs have been measured at the same time rather than at different timepoints. Therefore, strictly speaking, our analysis should be regarded as evidencing behavioral consistency rather than spillover.

Acknowledging this limitation, but based on the negative association between DPEB and ML, and ML and TPEB, we can still conclude, in addition to the positive role of identity, there is a negative role for licensing beliefs. For those who often perform PEBs in their daily lives but think they have done more than enough morally, the result can be fewer PEBs when on holiday compared to when at home, consistent with existing studies on the negative effects of moral licensing on behavioral spillover (Diekmann & Preisendorfer, 1998; Khan & Dhar, 2006; Mazar & Zhong, 2010; Thøgersen & Crompton, 2009). This might represent a limitation upon the practical value of advocating PEBs: if each person is content with only a single (perhaps easier) PEB, it is likely that environmental protection goals will not be met through changes in individual behavior.

1. The direct association between domestic and tourism pro-environmental behavior was *moderated* by environmental attachment. Hence, environmental attachment seems to play an important role in the consistency of individual environmental behaviors across these

contexts, reflecting previous research on the important role of environmental attachment on PEBs (Schultz et al., 2004; Sivek & Hungerford, 1990). This finding implies that a strong affective motive may be necessary before pro-environmental behaviors can overcome contextual barriers, such as different social norms and availability of necessary facilities. The concomitant implication is that a lack of attachment to the natural environment may limit a more widespread adoption of sustainable lifestyles. The result also shows that behavioral consistency between DPEB and TPEB occurs among those with high and low environmental attachment, but a higher EA will increase the strength of the association between DPEB and TPEB. This perhaps shows environmental attachment is not only an important driver of PEBs but also that highly attached people tend to be more committed to undertaking PEBs across contexts (including away from home).

Overall, these findings compliment previous research and are supportive of proposed mechanisms for positive spillover (Lanzini & Thøgersen, 2014; Thøgersen & Crompton, 2009; Thøgersen & Noblet, 2012) and negative spillover (Barr et al., 2010; Thøgersen & Crompton, 2009; Tiefenbeck et al., 2013). The results of negative effects from moral licensing beliefs develops the emerging literature on compensatory and licensing beliefs in relation to PEBs (Capstick et al., 2019; Kaklamanou et al., 2015), and broadens our understanding of moral licensing as a source of (in)consistency in pro-environmental behavior across contexts.

Contributions

This paper contributes to the growing body of literature on consistency and spillover of pro-environmental behaviors. It also provides insights into how to promote behavioral changes amongst tourists (Font & McCabe, 2017). We examined an under-researched but highly important context – tourism. In this study, contextual consistency of PEBs between home and holiday was evident, indicative of proposed spillovers between contexts (Berger, 1997; De Young, 2000; Evans et al., 2013; Lanzini & Thøgersen, 2014; Maiteny, 2002; Thøgersen & Crompton, 2009; Truelove et al., 2014; Whitmarsh & O'Neill, 2010; Whitmarsh et al., 2018).

This paper also makes an important contribution to the theoretical development of contextual spillover by showing some evidence that it could be mediated by some of the same factors proposed to mediate behavioral spillover: pro-environmental identity and moral licensing (e.g. Nash et al., 2017). Thus, it is possible that the two phenomena may depend upon similar psychological factors. That our results showed both direct and indirect (mediated) associations between behaviors in different contexts indicates that other mediating factors may also be present (cf., Whitmarsh et al., 2018).

Furthermore, there was evidence to suggest that consistency of pro-environmental behavior between contexts partly depends upon environmental attachment, with greater attachment corresponding to a closer association between behaviors across contexts. Although previous research has identified environmental attachment as a key factor in pro-environmental behavior (Cornelissen et al., 2008; De Groot & Steg, 2008; Whitmarsh & O'Neill, 2010), our study extends this by showing that contextual spillover may sometimes depend upon environmental attachment.

Implications

Based on our study, the following suggestions are made to promote more PEBs from tourists. Given that the domestic PEBs of tourists may affect their tourism PEBs, policymakers might encourage more pro-environmental activities at home. For example, by promoting energy efficiency, recycling and other pro-environmental behavior at home, these may spillover from one context to another. Conversely, though perhaps less likely, promoting PEBs in tourist contexts

(e.g. in eco-tourist resorts) may transfer to domestic or other contexts. Practitioners could encourage this spillover to domestic behavior through encouraging interaction with and experiences in natural landscapes at tourist sites, thereby increasing environmental attachment and motivations to perform PEBs. Activities such as visits to natural areas and national parks, ecotourism, hiking, etc., may foster this sense of connectedness with nature. Interventions could increase the pro-environmental identity (and/or reduce the moral licensing beliefs) of tourists or householders, thereby allowing pro-environmental behavior to cross from one context to another. For example, a vacation location or hotel might offer a green tourism award and thereby encourage tourists to see themselves as environmentally-friendly individuals (cf. Lacasse, 2016).

Since negative contextual spillover seems to be partly attributable to moral licensing beliefs, policy-makers could combine different behavioral interventions to in order to reduce this negative effect; this might be achieved by combining environmental education, communication and rewards for positive behavior (Truelove et al., 2014).

Limitations and recommendations

This study has its limitations. Self-report measures may be subject to a social desirability bias (Kormos & Gifford, 2014) and their similarity may lead to a common methods bias (Podsakoff et al., 2003), but these would apply in both contexts. We also only assessed five pro-environmental behaviors when many more exist. Therefore, future research may either focus on less subjective assessment of behavior or consider a variety of pro-environmental behaviors. There is also further scope either to consider spillovers between contexts and behaviors, such as from reducing car-use at home to respecting natural habitats when on holiday, or to assess other potential intervening factors, such as contextual as opposed to individual differences (Nash et al., 2017). This study also amounts to a promising initial investigation: experimental or longitudinal studies will be necessary to move from our correlational findings to demonstrating causal relationships; though questions in this study were phrased in terms of prior domestic actions and current tourist actions, a vital next step is to examine whether adopting PEBs in one context causes them to be adopted in another. It should be noted that, behavioral spillover generally means that one must show that change in an initial target behavior occurred, and that this initial behavior change led to a change in a second non-targeted behavior. It would generally be examined by conducting an experimental lab study or a field intervention. Instead, this analysis demonstrates the links between multiple variables all measured at one time point. However, it is still useful to demonstrate that environmental attachment, pro-environmental identity, and moral licensing beliefs all help explain the positive and negative links between Domestic PEBs and Tourism PEBs. This method has also been adopted by Whitmarsh and O'Neill (2010) and Stern et al. (1999) who demonstrate that various PEBs in different contexts can be predicted by certain psychological variables. But it does mean that the findings in our study should be interpreted with caution. For example, the unexpected positive spillover effect from DPEB to TPEB through moral licensing may be due to the questionnaire being measured at the same time, therefore, future research should use an experimental design to causally demonstrate behavioral spillover.

Disclosure statement

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References

Ali, F., Rasoolimanesh, S. M., Sarstedt, M., Ringle, C. M., & Ryu, K. (2018). An assessment of the use of partial least squares structural equation modeling (PLS-SEM) in hospitality research. *International Journal of Contemporary Hospitality Management*, 30(1), 514–538. doi:10.1108/IJCHM-10-2016-0568

Barr, S., & Gilg, A. W. (2006). Sustainable lifestyles: Framing environmental action in and around the home. *Geoforum*, 37(6), 906–920. doi:10.1016/j.geoforum.2006.05.002

Barr, S., Shaw, G., Coles, T., & Prillwitz, J. (2010). "A holiday is a holiday": Practicing sustainability, home and away. *Journal of Transport Geography*, 18(3), 474–481. doi:10.1016/j.jtrangeo.2009.08.007

Barr, S., Shaw, G., & Gilg, A. W. (2011). The policy and practice of 'sustainable lifestyles'. *Journal of Environmental Planning and Management*, 54(10), 1331–1350. doi:10.1080/09640568.2011.574996

Bem, D. J. (1967). Self-perception: An alternative interpretation of cognitive dissonance phenomena. *Psychological Review*, 74(3), 183–200. http://www.ncbi.nlm.nih.gov/pubmed/4867935. doi:10.1037/h0024835

Berger, I. E. (1997). The demographics of recycling and the structure of environmental behavior. *Environment and Behavior*, 29(4), 515–531. doi:10.1177/001391659702900404

Blanken, I., Van, d V. N., & Zeelenberg, M. (2015). A meta-analytic review of moral licensing. *Personality & Social Psychology Bulletin*, 41(4), 540–558. doi:10.1177/0146167215572134

Bratanova, B., Loughnan, S., & Gatersleben, B. (2012). The moral circle as a common motivational cause of cross-situational pro-environmentalism. *European Journal of Social Psychology*, 42(5), 539–545. doi:10.1002/ejsp.1871

Buckley, R. (2012). Sustainable tourism: Research and reality. *Annals of Tourism Research*, 39(2), 528–546. doi:10.1016/j.annals.2012.02.003

Caldeira, A. M., & Kastenholz, E. (2018). It's so hot: Predicting climate change effects on urban tourists' time–space experience. *Journal of Sustainable Tourism*, 26(9), 1516–1542. doi:10.1080/09669582.2018.1478840

Capstick, S., Whitmarsh, L., Nash, N., Haggar, P., & Lord, J. (2019). Compensatory and catalyzing beliefs: Their relationship to pro-environmental behavior and behavioral spillover in seven countries. *Frontiers in Psychology*, 10. doi:10.3389/fpsyg.2019.00963.

Chin, W. W. (1998). The partial least squares approach to structural equation modelling. In G. A. Marcoulides (Ed.), *Modern methods for business research* (pp. 295–336). Lawrence Erlbaum Associates.

Chiu, C., Hsu, M., Lai, H., & Chang, C. (2012). Reexamining the influence of trust on online repeat purchase intention: The moderating role of habit and its antecedents. *Decision Support Systems*, 53(4), 835–845. doi:10.1016/j.dss.2012.05.021

CCC. (2019). *Net zero: The UK's contribution to stopping global warming*. UK Committee on Climate Change.

Cornelissen, G., Pandelaere, M., Warlop, L., & Dewitte, S. (2008). Positive cueing: Promoting sustainable consumer behavior by cueing common environmental behaviors as environmental. *International Journal of Research in Marketing*, 25(1), 46–55. doi:10.1016/j.ijresmar.2007.06.002

Dawson, J. F. (2014). Moderation in management research: What, why, when and how. *Journal of Business and Psychology*, 29(1), 1–19. doi:10.1007/s10869-013-9308-7

De Groot, J. I. M., & Steg, L. (2008). Value orientations to explain beliefs related to environmental significant behavior: How to measure egoistic, altruistic, and biospheric value orientations. *Environment and Behavior*, 40(3), 330–354. doi:10.1177/0013916506297831

De Young, R. (2000). Expanding and evaluating motives for environmentally responsible behavior. *Journal of Social Issues*, 56(3), 509–526. doi:10.1111/0022-4537.00181

Diekmann, A., & Preisendorfer, P. (1998). Environmental behavior: Discrepancies between aspirations and reality. *Rationality and Society*, 10(1), 79–102. doi:10.1177/104346398010001004

Dietz, T., Gardner, G. T., Gilligan, J., Stern, P. C., & Vandenbergh, M. P. (2009). Household actions can provide a behavioral wedge to rapidly reduce US carbon emissions. *Proceedings of the National Academy of Sciences United States of America*, 106(44), 18452–18456. doi:10.1073/pnas.0908738106

Esfandiari, K., Dowling, R., Pearce, J., & Goh, E. (2019). Personal norms and the adoption of pro-environmental binning behavior in national parks: An integrated structural model approach. *Journal of Sustainable Tourism*, 28(1), 10–32. doi:10.1080/09669582.2019.1663203

Evans, L., Maio, G. R., Corner, A., Hodgetts, C. J., Ahmed, S., & Hahn, U. (2013). Self-interest and pro-environmental behaviour. *Nature Climate Change*, 3(2), 122–125. doi:10.1038/nclimate1662

Festinger, L. (1957). *A theory of cognitive dissonance*. Stanford University Press.

Font, X., & McCabe, S. (2017). Sustainability and marketing in tourism: Its contexts, paradoxes, approaches, challenges and potential. *Journal of Sustainable Tourism*, 25(7), 869–883. doi:10.1080/09669582.2017.1301721

Fox, D., & Xu, F. (2017). Social cultural influence on feelings and attitudes towards nature. *Asia Pacific Journal of Tourism Research*, 22(2), 187–199. doi:10.1080/10941665.2016.1217894

Frezza, M., Whitmarsh, L., SchäFer, M., & Schrader, U. (2018). Spillover Effects of Sustainable Consumption: Combining identity process theory and theories of practice. *Sustainability: Science, Practice and Policy*, 15(1), 15–30. doi:10.1080/15487733.2019.1567215

Fornell, C. G., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 18(1), 39–50. doi:10.2307/3151312

Garcia-Machado, J. (2017). Assessing a moderating effect and the global fit of a PLS model on online trading. *MINIB*, 26(4), 1–34.

Goudie, A. S. (2013). *The human impact on the natural environment: Past, present, and future* (7th ed.). Wiley-Blackwell.

Ha, S., & Kwon, S. Y. (2016). Spillover from past recycling to green apparel shopping behavior: The role of environmental concern and anticipated guilt. *Fashion & Textiles*, 3(1), 16.

Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to use and how to report the results of PLS-SEM. *European Business Review*, 31(1), 2–24. doi:10.1108/EBR-11-2018-0203

Hair, J. F., Sarstedt, M., Hopkins, L., & Kuppelwieser, V. G. (2014). Partial least squares structural equation modeling (PLS-SEM): An emerging tool in business research. *European Business Review*, 26(2), 106–121. doi:10.1108/EBR-10-2013-0128

Han, W., McCabe, S., Wang, Y., & Chong, A. Y. L. (2018). Evaluating user-generated content in social media: An effective approach to encourage greater pro-environmental behavior in tourism? *Journal of Sustainable Tourism*, 26(4), 600–614. doi:10.1080/09669582.2017.1372442

Henseler, J., & Fassott, G. (2010). Testing moderating effects in PLS path models: An illustration of available procedures. In V. Esposito Vinzi, W. W. Chin, J. Henseler, & H. Wang (Eds.), *Handbook of partial least squares: Concepts, methods and applications*. Springer Handbooks of Computational Statistics Series (Vol. II, pp. 713–735). Springer.

Henseler, J., Ringle, C. & Sinkovics, R. (2009). The use of partial least squares path modeling in international marketing. In R. Sinkovics, & P. Ghauri (Eds.) New Challenges to International Marketing (Advances in International Marketing), Emerald Group Publishing Limited. (Vol. 20, pp. 277–319). Bingley. https://doi.org/10.1108/S1474-7979(2009)0000020014.

Hungerford, H., Peyton, R., & Wilke, R. (1980). Goals for curriculum development in environmental education. *The Journal of Environmental Education*, 11(3), 42–47. doi:10.1080/00958964.1980.9941381

IPCC. (2014). *Climate change 2014 synthesis report summary chapter for policymakers*. https://ar5-syr.ipcc.ch/topic_summary.php accessed 09 Feb 2020.

Jöreskog, K. G. (1973). A general method for estimating a linear structural equation system. In A. S. Goldberger & O. D. Duncan (Eds.), *Structural equation models in the social sciences* (pp. 255–284). Seminar Press.

Juvan, E., & Dolnicar, S. (2016). Measuring environmentally sustainable tourist behavior. *Annals of Tourism Research*, 59, 30–44. doi:10.1016/j.annals.2016.03.006

Kaiser, F. G., Wölfing, S., & Fuhrer, U. (1999). Environmental attitude and ecological behaviour. *Journal of Environmental Psychology*, 19(1), 1–19. doi:10.1006/jevp.1998.0107

Kaklamanou, D., Jones, C. R., Webb, T. L., & Walker, S. R. (2015). Using public transport can make up for flying abroad on holiday: Compensatory green beliefs and environmentally significant behavior. *Environment and Behavior*, 47(2), 184–204. doi:10.1177/0013916513488784

Kanchanapibul, M., Lacka, E., Wang, X., & Chan, H. K. (2014). An empirical investigation of green purchase behaviour among the young generation. *Journal of Cleaner Production*, 66(3), 528–536. doi:10.1016/j.jclepro.2013.10.062

Kenny, D. A. (2016). *Moderation*. http://davidakenny.net/cm/moderation, Accessed 02 Feb 2020.

Khan, U., & Dhar, R. (2006). Licensing effect in consumer choice. *Journal of Marketing Research*, *43*(2), 259–266. doi:10.1509/jmkr.43.2.259

Klöckner, C. A., Nayum, A., & Mehmetoglu, M. (2013). Positive and negative spillover effects from electric car purchase to car use. *Transportation Research Part D: Transport and Environment*, *21*(2), 32–38. doi:10.1016/j.trd.2013.02.007

Kollmuss, A., & Agyeman, J. (2002). Mind the gap: Why do people act environmentally and what are the barriers to pro-environmental behavior? *Environmental Education Research*, *8*(3), 239–260. doi:10.1080/13504620220145401

Kormos, C., & Gifford, R. (2014). The validity of self-report measures of pro-environmental behavior: A meta-analytic review. *Journal of Environmental Psychology*, *40*, 359–371. doi:10.1016/j.jenvp.2014.09.003

Lacasse, K. (2016). Don't be satisfied, identify! Strengthening positive spillover by connecting pro-environmental behaviors to an "environmentalist" label. *Journal of Environmental Psychology*, *48*, 149–158. doi:10.1016/j.jenvp.2016.09.006

Lanzini, P., & Thøgersen, J. (2014). Behavioral spillover in the environmental domain: An intervention study. *Journal of Environmental Psychology*, *40*, 381–390. doi:10.1016/j.jenvp.2014.09.006

Lee, T. H., Jan, F. H., & Yang, C. C. (2013). Conceptualizing and measuring environmentally responsible behaviors from the perspective of community-based tourists. *Tourism Management*, *36*, 454–468. doi:10.1016/j.tourman.2012.09.012

Littleford, C., Ryley, T., & Firth, S. (2014). Context, control and the spillover of energy use behaviours between office and home settings. *Journal of Environmental Psychology*, *40*, 157–166. doi:10.1016/j.jenvp.2014.06.002

Maiteny, P. T. (2002). Mind in the gap: Summary of research exploring "inner" influences on pro-sustainability learning and behaviour. *Environmental Education Research*, *8*(3), 299–306. doi:10.1080/13504620220145447

Margetts, E. A., & Kashima, Y. (2017). Spillover between pro-environmental behaviors: The role of resources and perceived similarity. *Journal of Environmental Psychology*, *49*, 30–42. doi:10.1016/j.jenvp.2016.07.005

Mazar, N., & Zhong, C. B. (2010). Do green products make us better people? *Psychological Science*, *21*(4), 494–498. doi:10.1177/0956797610363538

Melillo, J. M., Richmond, T. C., & Yohe, G. (2014). *Climate change impacts in the United States: The third National Climate Assessment*. US Global Change research program. 10.7930/j0z31WJ2.

Meneses, G. D. (2010). Refuting fear in heuristics and in recycling promotion. *Journal of Business Research*, *63*(2), 104–110. doi:10.1016/j.jbusres.2009.02.002

Merritt, A. C., Effron, D. A., & Monin, B. (2010). Moral self-licensing: When being good frees us to be bad. *Social and Personality Psychology Compass*, *4/5*, 344–357. doi:10.1111/j.1751-9004.2010.00263.x

Miller, D. T., & Effron, D. A. (2010). Chapter three-psychological license: When it is needed and how it functions. *Advances in Experimental Social Psychology*, *43*, 115–155. 10.1016/S0065-2601(10)43003-8.

Miller, G., Rathouse, K., Scarles, C., Holmes, K., & Tribe, J. (2007). *Public understanding of sustainable leisure and tourism: A research report completed for the Department for Environment, Food and Rural Affairs by the University of Surrey*, 1–239. https://www.surrey.ac.uk/sbs/files/ST&L%20report.pdf accessed on 15 March 2019.

Nash, N., Whitmarsh, L., Capstick, S., Hargreaves, T., Poortinga, W., Thomas, G., Sautkina, E., & Xenias, D. (2017). Climate-relevant behavioral spillover and the potential contribution of social practice theory. *WIREs Climate Change*, *8*. 10.1002/wcc.481

Nitzl, C. (2016). The use of partial least squares structural equation modelling (PLS-SEM) in management accounting research: Directions for future theory development. *Journal of Accounting Literature*, *37*(December), 19–35. doi:10.1016/j.acclit.2016.09.003

Nitzl, C., Roldan, J. L., & Cepeda, G. (2016). Mediation analysis in partial least squares path modeling: Helping researchers discuss more sophisticated models. *Industrial Management & Data Systems*, *116*(9), 1849–1864. doi:10.1108/IMDS-07-2015-0302

Podsakoff, P. M., MacKenzie, S. B., Lee, J.-Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology*, *88*(5), 879–903. doi:10.1037/0021-9010.88.5.879

Poortinga, W., Whitmarsh, L., & Suffolk, C. (2013). The introduction of a single-use carrier bag charge in Wales: Attitude change and behavioral spillover effects. *Journal of Environmental Psychology*, *36*, 240–247. doi:10.1016/j.jenvp.2013.09.001

Ramkissoon, H., & Mavondo, F. (2015). The satisfaction-place attachment relationship: Potential mediators and moderators. *Journal of Business Research*, *68*(12), 2593–2602. doi:10.1016/j.jbusres.2015.05.002

Ramkissoon, H., Smith, L. D. G., & Weiler, B. (2013). Relationships between place attachment, place satisfaction and pro-environmental behaviour in an Australian national park. *Journal of Sustainable Tourism*, *21*(3), 434–457. doi:10.1080/09669582.2012.708042

Sachdeva, S., Iliev, R., & Medin, D. L. (2009). Sinning saints and saintly sinners: The paradox of moral self-regulation. *Psychological Science*, *20*(4), 523–528. doi:10.1111/j.1467-9280.2009.02326.x

Scannell, L., & Gifford, R. (2010). The relations between natural and civic place attachment and pro-environmental behavior. *Journal of Environmental Psychology*, *30*(3), 289–297. doi:10.1016/j.jenvp.2010.01.010

Schultz, R. A., Okubo, C. H., Goudy, C. L., & Wilkins, S. J. (2004). Igneous dikes on mars revealed by mars orbiter laser altimeter topography. *Geology*, *32*(10), 889–892. doi:10.1130/G20548.1

Sivek, D. J., & Hungerford, H. (1990). Predictors of responsible behavior in members of three Wisconsin conservation organizations. *The Journal of Environmental Education*, *21*(2), 35–40. doi:10.1080/00958964.1990.9941929

Steg, L., Dreijerink, L., & Abrahamse, W. (2005). Factors influencing the acceptability of energy policies: A test of VBN theory. *Journal of Environmental Psychology*, *25*(4), 415–425. doi:10.1016/j.jenvp.2005.08.003

Steg, L., & Vlek, C. (2009). Encouraging pro-environmental behaviour: An integrative review and research agenda. *Journal of Environmental Psychology*, *29*(3), 309–317. doi:10.1016/j.jenvp.2008.10.004

Stern, P. C., Dietz, T., Abel, T., Guagnano G. A., & Kalof, L. (1999). A value-believe-norm theory of support for social movements: the case of environmentalism. *Research in Human Ecology*. 6(2): 81–97.

Stern, P. C. (2000). Toward a coherent theory of environmentally significant behavior. *Journal of Social Issues*, *56*(3), 407–424. doi:10.1111/0022-4537.00175

Straughan, R. D., & Roberts, J. A. (1999). Environmental segmentation alternatives: A look at green consumer behavior in the New Millennium. *Journal of Consumer Marketing*, *16*(6), 558–575. doi:10.1108/07363769910297506

Thøgersen, J. (1999). Spillover processes in the development of a sustainable consumption pattern. *Journal of Economic Psychology*, *20*(1), 53–81. doi:10.1016/S0167-4870(98)00043-9

Thøgersen, J., & Crompton, T. (2009). Simple and painless? The limitations of spillover in environmental campaigning. *Journal of Consumer Policy*, *32*(2), 141–163. doi:10.1007/s10603-009-9101-1

Thøgersen, J., & Noblet, C. (2012). Does green consumerism increase the acceptance of wind power? *Energy Policy*, *51*(6), 854–862. doi:10.1016/j.enpol.2012.09.044

Thøgersen, J., & Olander, F. (2003). Spillover of environment-friendly consumer behaviour. *Journal of Environmental Psychology*, *23*(3), 225–236. doi:10.1016/S0272-4944(03)00018-5

Thøgersen, J., & Olander, F. (2006). To what degree are environmentally beneficial choices reflective of a general conservation stance? *Environment and Behavior*, *38*(4), 550–569. doi:10.1177/0013916505283832

Tonge, J., Ryan, M. M., Moore, S. A., & Beckley, L. E. (2015). The effect of place attachment on pro-environment behavioral intentions of pro-environmental behavioural intentions of visitors to coastal natural area tourist destinations. *Journal of Travel Research*, *54*(6), 730–743. doi:10.1177/0047287514533010

Tiefenbeck, V., Staake, T., Roth, K., & Sachs, O. (2013). For better or for worse? Empirical evidence of moral licensing in a behavioral energy conservation campaign. *Energy Policy*, *57*(6), 160–171. doi:10.1016/j.enpol.2013.01.021

Truelove, H. B., Carrico, A. R., Weber, E. U., Raimi, K. T., & Vandenbergh, M. P. (2014). Positive and negative spillover of pro-environmental behavior: An integrative review and theoretical framework. *Global Environmental Change*, *29*, 127–138. doi:10.1016/j.gloenvcha.2014.09.004

United Nations World Tourism Organization. (2018). Tourism highlights 2018 edition. https://www.e-unwto.org/doi/pdf/10.18111/9789284419876 accessed 02 June 2019

Urban, J., Bahník, Š., & Kohlová, M. B. (2019). Green consumption does not make people cheat: Three attempts to replicate moral licensing effect due to pro-environmental behavior. *Journal of Environmental Psychology*, *63*, 139–147. doi:10.1016/j.jenvp.2019.01.011

Van der Werff, E., Steg, L., & Keizer, K. (2013). It is a moral issue: The relationship between environmental self-identity, obligation-based intrinsic motivation and pro-environmental behaviour. *Global Environmental Change*, *23*(5), 1258–1265. doi:10.1016/j.gloenvcha.2013.07.018

Verfuerth, C., Jones, C. R., Gregory-Smith, D., & Oates, C. (2019). Understanding contextual spillover: Using identity process theory as a lens for analyzing behavioral responses to a workplace dietary choice intervention. *Frontiers in Psychology*, *10*, 345. doi:10.3389/fpsyg.2019.00345

Whitburn, J., Linklater, W., & Abrahamse, W. (2019). Meta-analysis of human connection to nature and proenvironmental behavior. *Conservation Biology*, *34*(1), 180–193. doi:10.1111/cobi.13381

Whitmarsh, L., & O'Neill, S. (2010). Green identity, green living? The role of pro-environmental self-identity in determining consistency across diverse pro-environmental behaviors. *Journal of Environmental Psychology*, *30*(3), 305–314. doi:10.1016/j.jenvp.2010.01.003

Whitmarsh, L. E., Haggar, P., & Thomas, M. (2018). Waste reduction behaviors at home, at work, and on holiday: What influences behavioral consistency across contexts? *Frontiers in Psychology*, *9*. doi:10.3389/fpsyg.2018.02447

Willis, M. M., & Schor, J. B. (2012). Does changing a light bulb lead to changing the world? Political action and the conscious consumer. *The Annals of the American Academy of Political and Social Science*, *644*(1), 160–190. doi:10.1177/0002716212454831

Xu, F., & Fox, D. (2014). Modelling attitudes to nature, tourism and sustainable development in national parks: A survey of visitors in China and the UK. *Tourism Management*, *45*(1), 142–158. doi:10.1016/j.tourman.2014.03.005