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# Modeling the psychological antecedents to tourists' pro-sustainable behaviors: an application of the value-belief-norm model

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## ABSTRACT

Understanding the psychological mechanisms underpinning tourists' voluntary adoption of behaviors that minimize harm to environments and communities that support tourism is critical for the sustainability of the industry. In this study, we examined the internal attributes that lead tourists to adopt three dimensions of pro-sustainable behavior drawing on the value-belief-norm model. We hypothesized that pro-sustainable behavior is reflected in three dimensions of intent related to behaviors that reduce environmental impacts, the consumption of local goods and services, and a willingness to sacrifice time and money to choose sustainable options. Additionally, hypothesized behavior to be a function of altruistic values, beliefs and Personal Norms. Data were drawn from a panel of active US tourists (*N* = 623). The hypothesized model predicting pro-sustainable behavior was tested using structural equation modeling techniques. Results demonstrate that the model adequately fit the data, and that Personal Norms account for a considerable degree of variance in tourists' pro-sustainable behavioral intent. Biospheric values were found to influence behavioral intent mediated by value-belief-norm model constructs.

## Introduction

Understanding and predicting the environmentally significant behaviors of tourists has been a steadfast pursuit in the sustainable tourism literature (Higham & Carr, 2002; Lee & Moscardo, 2005; Miller, Merrilees, & Coghlan, 2015). While many scholars have explored tourists' environmental attitudes (Dolnicar, 2010; Winter, 2007), and endeavored to determine the causes of tourists' adoption of pro-environmental behaviors (PEBs) (Juvan & Dolnicar, 2014), much work is needed concerning the factors that motivate such actions, and the scope of behaviors conducted by tourists that enhance the sustainability of the industry, local communities and environments. This observation has motivated scholars to begin to model the psychological processes that underpin tourists' engagement in PEBs (Chen & Tung, 2014; Powell & Ham, 2008), and has spurred interest in the measurement of behaviors intended to promote sustainability.

Tourism activity has the potential to generate both positive and negative impacts from local to global scales. For instance, consumptive decisions made by tourists can have negative local environmental, social, and economic consequences in the form of waste generation and resource use (Mbaiwa, 2003), commodification of host community cultures (Devine, 2017), and

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the development of tourism economies that produce marginal benefits for local people (Gezon, 2014). Additionally, global consequences may result from fossil energy consumption and carbon emissions stemming from tourists' choice of travel alternatives (Scott & Becken, 2010). Thus, tourists have the ability to act as force for good based on how they spend their money and the specific behaviors they adopt to minimize the harm that they impose on other people and the environment (Boley, 2015). For example, tourists' expenditures on locally produced food and crafts can stem the homogenizing effect of globalization through providing a market-based mechanism to support the local over the global (Everett & Aitchison, 2008; Sims, 2009). Additionally, the ecological footprint of locally produced goods, foods and beverages are smaller with respect to shipping and carbon emissions (Gossling, Garrod, Aall, Hillie, & Peeters, 2011). Tourists' demand for sustainable lodging practices can also incentivize business owners and corporations to "go green" and to incorporate local cuisine and art in to the design of hotels. Hence, the importance of understanding behaviors that enhance sustainability and the antecedents to their adoption.

While near unanimous agreement exists regarding the importance of the tourism industry mitigating its impacts across the entirety of the triple bottom line (Dwyer, 2005; Saarinen, 2006), past work exploring the behavioral decisions of tourists with respect to sustainability has two important gaps. First, the majority of this research has conflated sustainability with the environment per se, and thus examined tourists' intent to mitigate their negative impacts on the environment specifically (Cheng & Wu, 2015; Miller et al., 2015). It is clear that in order for tourism to be sustainable, consideration must be given to impacts on local economies and communities in addition to the environment, and by extension, how tourists behave with regard to the potential impacts they generate in these domains (Boley & Nickerson, 2013; Stoddard, Pollard, & Evans, 2012). Second, much of the previous research modeling PEB in the context of tourism has been either ad hoc with regard to the antecedent variables hypothesized to influence behavior (Dolnicar, Crouch, & Long, 2008), or couched within the Reasoned Action Model (e.g. Theory of Planned Behavior) (Kim & Han, 2009; Miao & Wei, 2016). While the Reasoned Action Model is a robust framework that has been widely applied in the social sciences as a means to explain volitional behaviors, it is rooted in an expectancy-value theory of behavior (Ajzen, 1991). Therefore, it is potentially limited in its ability to explain PEBs which many hypothesize are driven by the activation of altruistic values, beliefs and Personal Norms (Bamberg & Moser, 2007; Stern & Dietz, 1994). A coherent theoretical model is needed if the field is to begin to generate incremental knowledge about the causes of sustainable tourist behavior, and thus, develop strategies to encourage it.

With these gaps in mind, this study sought to broaden the scope of actions germane to understanding tourists' "pro-sustainable" behaviors, and model the antecedent psychological processes that underpin their adoption. We hypothesized that in addition to individual actions that mitigate direct environmental impacts (e.g. recycling, reducing water use) that pro-sustainable tourist behavior is reflected in an intent to consume locally produced goods and services (i.e. "Localism"), and a willingness incur greater financial costs, or experience longer travel times, to choose goods and services that embody a green ethos (i.e. "Willingness to Sacrifice"). Second, we hypothesized that adoption of these behaviors stems from the activation of altruistic values, beliefs, and Personal Norms related to the environment and sustainability. Thus, in this study we drew on the value-belief-norm model (Stern, Dietz, Abel, Guagnano, & Kalof, 1999) to understand the psychological processes that influence multiple dimensions of tourists' pro-sustainable behavioral intent. Greater understanding of the varied dimensions of tourists' pro-sustainable behaviors and the psychological processes that underpin them, can better equip academics and practitioners within the field with tools to leverage behavior change, and protect sensitive environments and communities that support tourism activities, conservation, and livelihoods.

## Literature review

### *Conceptual orientation: the value-belief-norm model*

The value-belief-norm (VBN) model is the product of the convergence of two theoretical traditions. First is Values Theory (e.g. Schwartz & Bilsky, 1987), which hypothesizes that human attitudes and behaviors are the function of enduring, trans-situational beliefs about desired end states of social interaction. Values are stable constructs that serve as evaluative criteria for judging and responding to the world, and thus, shape higher-order beliefs, attitudes and behaviors that correspond to specific attitude objects (Schwartz, 1994). Second is Norm Activation Theory (Schwartz, 1977), which was developed as a general theory of altruism. Norm Activation Theory hypothesizes that altruistic behavior originates from a moral obligation to prevent harm to a valued object. Personal Norms – internalized moral beliefs – are said to be activated when an individual possess a responsibility for their actions and an awareness that a threat exists to an object of value. Together, Stern (2000) and Stern et al. (1999, p. 441) suggest that these theories explain the moral normative basis of environmentalism, or more specifically "the propensity to take actions with pro-environmental intent." Drawing on Stern (2000), van Riper and Kyle (2014) define behavior as "intent-oriented action performed as a function of internal processes", and suggest that PEBs are those that intend to "minimize the negative impacts of one's actions on the natural and built world (Kollmus & Agyeman, 2002, p. 240)." Thus, PEBs are those actions that stem from internalized beliefs about the impacts of one's behavior on other humans and the environment and are undertaken with an intent to minimize them. This is the interpretation of behavior that we adopt for this study.

The VBN model postulates a causal chain of environmentally referent cognitions that underpin one's propensity to engage in PEBs. Values form the foundation of these cognitive structures. Though Values Theory demonstrates a host of culturally conserved dimensions, past work has identified three dominant orientations that predict environmental concern and action (Schultz, 2001; Stern & Dietz, 1994), namely Egoistic, Altruistic and Biospheric values. Egoistic Values reflect beliefs about the self in relation to nature. More specifically, egoists evaluate the world in terms of personal gain, and behave in a manner that confers maximum individual utility. Thus, environmentalism has been shown to negatively correlate with Egoistic Values. Altruistic Values are beliefs about the importance of others' well-being. Whereas, Biospheric Values indicate one's propensity to judge phenomena on "the costs or benefits to ecosystems or the biosphere." (Stern & Dietz, 1994, p. 70). Both Altruistic and Biospheric Value orientations are thought to positively influence environmental concern and engagement in PEBs, as they represent moral beliefs about one's behavior with intent toward other humans or the environment.

Further up the cognitive hierarchy, values shape basic beliefs about the human–environment relationship. In the context of the VBN model, these beliefs have been dubbed an environmental worldview and operationalized using (Dunlap, Van Liere, Mertig, & Jones, 2000) New Ecological Paradigm (NEP). An environmental worldview serves as a lens to focus selective attention on environment-related information. While values are cognitive representations of one's beliefs about the way things ought to be, worldviews are beliefs about the way things are. Endorsement of the NEP is an acceptance of a set of beliefs that posits that humanity is a part of nature, as opposed to apart from it, and thus, is subject to the constraints of a physically limited world (Dunlap et al., 2000). The NEP has been widely adopted in the conservation psychology and environmental sociology literatures, and shown to influence a variety of environmental attitudes and behaviors (Cordano, Welcomer, & Scherer, 2003).

Endorsement of the NEP is hypothesized to influence one's awareness that their behavior may generate negative consequences for the environment or other humans. Awareness of Consequence and Ascription of Responsibility are prerequisite to the activation of Personal Norms. Awareness of Consequence and Ascription of Responsibility refer to beliefs that one's behaviors may influence valued-objects, and that mitigating those influences is within one's control, respectively. Schwartz (1977) suggests that when these conditions are present in a given context that it may lead to the

activation of cognitive structures of norms and values that induce feelings of moral obligation to act in a manner consistent with deeply held beliefs. Thus, in the VBN model, when an individual is presented with a behavioral decision they are compelled to act in a manner that minimizes their impact on the environment and other humans, to the extent that they subscribe to underlying Biospheric and Altruistic Values in order to avoid feelings of guilt, which ultimately motivate behavior.

The VBN model has been used in a variety of research contexts to explain PEBs. Stern et al.'s original work (1999; Stern, 2000), for instance, demonstrated that the model accounted for substantial variance in the environmentally significant behaviors of a sample of the American public. van Riper and Kyle (2014) found that the VBN model provided a framework to explain the psychological mechanisms leading to the adoption of PEBs among visitors to the Channel Islands National Park, USA. Raymond, Brown, and Robinson (2011) demonstrated that Australian landholders' native vegetation conservation practices were related to personal normative beliefs stemming from the activation of altruistic values; in addition to their attachment to the land. Similarly, Wynveen and Sutton (2017) found utility in the VBN as a framework to predict the self-reported PEBs of residents near the Great Barrier Reef, Australia. Finally, Wynveen, Kyle, and Tarrant (2012) drew on the VBN as a framework to conceptualize the learning outcomes of study abroad participants. Findings from this study shed light on the potential for nature experience and learning as a means to shape students' moral development by targeting model constructs in curriculum design (Landon, Tarrant, Rubin, & Stoner, 2017). These studies, and others, demonstrate the utility of the VBN as a framework for explaining the psychological processes that underpin environmentally significant behavior, and potentially for understanding pro-sustainable behavior in tourism contexts specifically.

### Pro-environmental behavior among tourists

A substantial body of work exists that has explored PEBs in the context of tourism. Thus, as one might imagine, a plethora of antecedents have been hypothesized to explain behavior. Dolnicar (2010) and Dolnicar et al. (2008), in their extensive reviews of such work, highlight that education, age, interest in learning, income and environmental concern were some of the variables most commonly included in models purporting to explain the behaviors of "environmentally-friendly tourists.".

Several studies have drawn on the Theory of Planned Behavior (TPB) (Ajzen, 1991), and its progenitor, the Theory of Reasoned Action, in work exploring tourists' PEB. The TPB has been used in the contexts of recreational divers (Ong & Musa, 2011); national parks (Brown, Ham, & Hughes, 2010); tourists' intentions to select eco-friendly restaurants (Kim, Njite, & Hancer, 2013); museum patrons' pro-environmental behavioral intentions (Han & Hyun, 2017); tourists' intentions to choose green hotels (Chen & Tung, 2014; Han & Kim, 2010; Han, Hsu, & Sheu, 2010); and tourists' actual behavior in staying at green hotels (Chen & Peng, 2012), among many others. In this tradition, behavior is thought to be volitional, and most proximately a function of one's intent to undertake it. In turn, intention arises from one's cognitive evaluation of the expected benefits obtained from engaging in the behavior, perceived appropriateness of the behavior in the social sphere, as well as one's perceived control in carrying it out (Landon, Kyle, & Kasier, 2016). Thus, the TPB is a general theory of goal-directed behavior applicable to a wide variety of contexts (Ajzen, 1991). However, the TPB – and associated models – fall short of explaining the cognitive processes that influence altruism. A growing body of work (Raymond et al., 2011; van Riper & Kyle, 2014), however, suggests that altruistic values underpin environmentally significant behavior, and thus, models adopting a moral normative lens are the appropriate tools for their analysis (Landon, Kyle, & Kaiser, 2017; Thogersen, 1996).

Several scholars have adopted this position in the tourism literature, and generated empirical evidence demonstrating the relationship between moral obligations and tourists' environmentally responsible behaviors. Doran and Larsen (2016, p. 160), for instance, argued that Personal Norms were most salient in explaining tourists' willingness to engage in PEB stating that, "personal norms are a stronger predictor than other psychological variables (e.g. personal values, environmental concern) or sociodemographic characteristics (e.g. age, education level, political orientation)". Similar

sentiments are echoed in the work by Mehmetoglu (2010) and Brown et al. (2010), who found moral obligation (i.e. Personal Norms) to be crucial in determining willingness to engage in PEB. Moving beyond intentions, Ong and Musa (2011) and Berenguer, Corraliza, and Martin (2005) provided further support of the role that Personal Norms play in explaining PEB among tourists. Dolnicar (2010) found that both Personal Norms and income levels were most significant predictors among tourists demonstrating environmentally friendly behavior.

While moral normative explanations of PEB have begun to take hold in the tourism literature, fewer studies have drawn on the VBN model in the tourism context specifically. Han (2015), in a study of tourists' PEB, tested an integrated model including variables from both the TPB and the VBN. Similarly, Kiatkawsin and Han (2017) tested a model merging expectancy theory and the VBN. Though the authors in each case did not assess actual behavior, results revealed that personal values, the NEP, awareness of consequences, ascription of responsibility and Personal Norms all significantly explained PEB intention. Similarly, Choi, Jang, and Kandampully (2015) implemented a version of the VBN in a study of tourists' intent to stay at "green hotels", finding support for causal relationships hypothesized by the model. Han, Hwang, and Lee (2017a) have also sought to expand the VBN to include positive/negative affect. These authors found that anticipated feeling of pride partially mediates the relationship between ascription of responsibility and Personal Norms in a panel study of cruise ship customers. Additionally, these authors explored several behavioral dimensions, finding that Personal Norms predicted cruise ship goers' willingness to sacrifice to source green goods and services, intent to purchase green goods, and encourage others to do the same.

However, much still stands to be learned regarding the application of the VBN model to understand tourists' PEBs. For instance, a plethora of previous work employing the VBN to explore tourists' PEB has focused on explaining tourists' intent to choose green accommodations specifically (e.g. Choi, Jang, & Kandampully, 2015; Han, 2015), or a single dimension of intent to mitigate environmental impact (e.g. Kiatkawsin & Han, 2017). As we have argued, the scope of behaviors relevant to sustainable tourism is much larger. Few studies have explored multiple dimensions of behavior in the context of sustainable tourism (Han, Hwang, & Lee, 2017a, 2017b). Additionally, many of these studies have included variables from several different theoretical and disciplinary traditions in an attempt to increase explanatory power. Although behavioral prediction is the goal of work assessing attitude behavior correspondence, empiricism does little to advance theory. In fact, there are few stand-alone applications of the VBN model, using a latent variable approach, conducted in the context of tourism or recreation (van Riper & Kyle, 2014). Thus, in this study we drew on the VBN model as a means to explain multiple dimensions of tourists' pro-sustainable behavioral intent. This study contributes to an understanding of the different behaviors, beyond private-sphere environmental conservation, that support sustainability, and tests their relationships with tourists' values, beliefs and Personal Norms.

### Hypotheses and hypothesized model

Drawing on past research (Stern, 2000; Stern et al., 1999), we hypothesize that values form the basis of a causal chain of environmentally referent cognitions leading to the activation of Personal Norms that influence tourists' engagement in pro-sustainable behaviors. Specifically, we hypothesize that tourists that hold Biospheric and Altruistic Values are more likely to accept an environmental worldview that positions humans as a part of nature. Similarly, we hypothesize that Egoistic Values are negatively associated with an eco-centric environmental worldview. Next, following the VBN model, we hypothesize that an acceptance of an environmental worldview that positions humans as part of nature, as measured by the NEP, leads to an awareness of the potential consequences (Awareness of Consequence) of one's consumer decisions on the environment. In turn, we hypothesized that an Awareness of Consequence is positively associated with an Ascription of Responsibility to the self to mitigate potential harms to human and non-human others. An Ascription of Responsibility is subsequently hypothesized to positively influence the activation of Personal Norms regarding one's
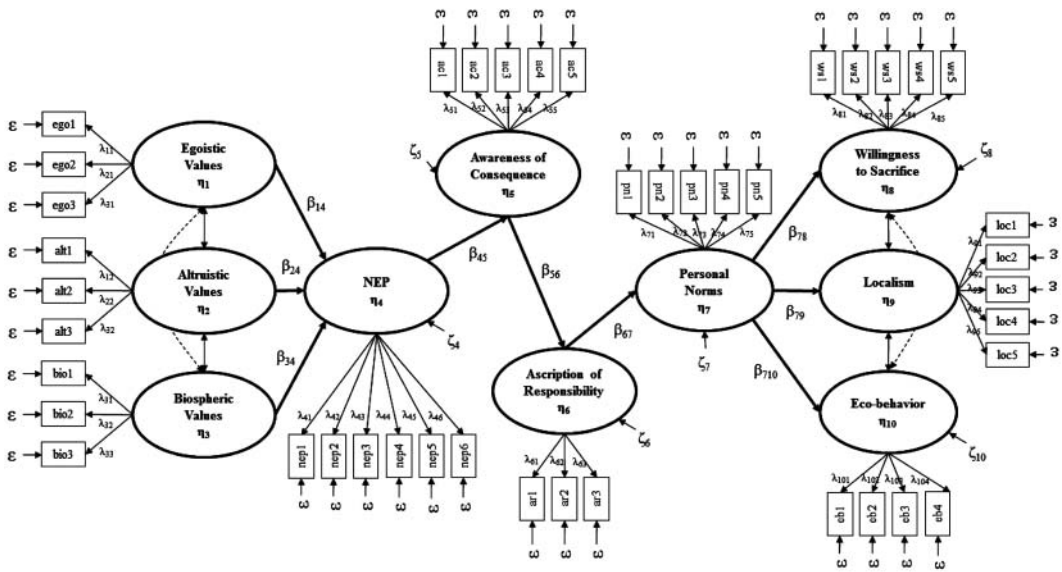
**Figure 1.** Hypothesized VBN model of the psychological antecedents to pro-sustainable tourist behavior.

behavior with respect to sustainability in tourism. Finally, Personal Norms are hypothesized to positively predict an intent to engage in three dimensions of pro-sustainable behavior. A graphical summary of these hypotheses and model relationships to be estimated are summarized in Figure 1.

H1: Biospheric values are positively related to NEP
H2: Altruistic values are positively related to NEP
H3: Egoistic values are negatively related to NEP
H4: NEP is positively related to Awareness of Consequence
H5: Awareness of Consequence is positively related to Ascription of Responsibility
H6: Ascription of Responsibility is positively related to Personal Norms
H7: Personal Norms are positively related to Willingness to Sacrifice
H8: Personal Norms are positively related to Localism
H9: Personal Norms are positively related to Eco-behavior

## Methods

### Data collection

The VBN model was tested using data elicited from a panel of US travelers, during June and July of 2017, provided by the global market research firm *Issues and Answers*. Online panels from reputable market research firms have been found to be reliable and lacking in response bias that is common to other data collection methods (Boley, Jordan, Kline, & Knollenberg, 2018). The panel was limited to US residents 18 years of age and older who had an annual household income above $50,000 and that had spent at least one night away from home in a lodging establishment within the past year. These thresholds were included to ensure that the sample was in fact reflective of the US travel market. Thus, the respondents are not representative of adults in the US as a whole, but are drawn from individuals currently engaged in overnight travel.

Of the 944 US residents that participated in the survey, 237 did not meet the above requirements and were removed from the data-set. Furthermore, to increase the validity of the data, 84 respondents who took less than seven minutes to complete the 186 item survey were removed. This resulted in a final sample of 623 US tourists. A small majority of respondents identified themselves as female

(59%). Respondents were highly educated with 69% possessing a bachelor's degree or higher. Finally, a clear majority of respondents identified as Caucasian (89.1%) compared to other races and ethnicities.

## *Measures*

Items used to measure model constructs were derived from past work. Egoistic, Altruistic and Biospheric Values were each measured with three items adapted from van Riper and Kyle (2014). Values items were measured on a 7pt Likert-type scale where 1 = Not at all important and 7 = Extremely important following the stem "how important are each of the following statements as guiding principles in your life?" The NEP was assessed on a 7pt Likert-type scale using the reduced form six item version (van Riper & Kyle, 2014), following the stem "please indicate your agreement with the following items" where 1 = Strongly disagree and 7 = Strongly agree. Awareness of Consequence was operationalized with five items adapted from van Riper and Kyle (2014) and Raymond et al. (2011). Items were measured on a 7pt Likert-type scale where 1 = Not at all a problem and 7 = A very serious problem, following the stem "to what extent do you feel the following are problems created by travel and tourism?" We limited the scope of impact to tourism specifically so that it aligns with issues that are under the potential control of the individual while engaging in the activity. Ascription of Responsibility (3 items) and Personal Norms (5 items) were measured on a 7pt Likert-type scale where 1 = Strongly disagree and 7 = Strongly agree following the prompt "please indicate your agreement with each of the following" (Steg & de Groot, 2010). Willingness to Sacrifice was operationalized with five items adapted from Stern et al. (1999) and Doran and Larsen (2016). Items were measured on 7pt agreement scale following the stem "please indicate your agreement with each of the following statements measuring your willingness to choose sustainable tourism options." The constructs, Eco-behavior (4 items) and Localism (5 items) were comprised of items from past work exploring PEB (Stern et al., 2000; Larson, Stedman, Cooper, & Decker, 2015) and locally beneficial tourism behavior (Boley, Nickerson, & Bosak, 2011). Items measuring these constructs were recorded on a 7pt Likert-type scale where 1 = Not at all likely and 7 = Extremely likely, following the stem, "the next time you travel, how likely are you to engage in the following?"

## *Analysis*

We adopted a two-step approach for latent variable modeling in our analysis (Anderson & Gerbing, 1988). First, the hypothesized factor structure was tested for construct validity using confirmatory factor analysis (CFA), followed by a test of the hypothesized structural relationships. All models were estimated in Stata version 15 (StataCorp, 2017) using the full information maximum likelihood estimator to account for missing values. Model fit was assessed using the criteria proposed by Hu and Bentler (1999) (Root Mean Square Error of Approximation (RMSEA) $\leq$0.07; Comparative Fit Index (CFI) $\geq$ 0.95; Non-normed Fit Index (NNFI) $\leq$ 0.95). Construct validity, "the extent to which a set of measured items actually reflect the theoretical latent constructs those items are designed to measure" (Hair, Black, Babin, & Anderson, 2010, p. 686), was assessed based on convergent, discriminant and nomological validity. Convergent validity was considered acceptable if standardized factor loadings were significant and above 0.4, values of Composite Reliability exceeded 0.7 and values of Average Variance Explained (AVE) exceeded 0.5 (Hair et al., 2010; Netemeyer, Bearden & Sharma, 2003). Discriminant validity was said to be achieved if the squared correlation between two latent constructs did not exceed the AVE for either of the two constructs. Nomological validity, or predicative validity, was assessed through the testing of the hypothesized relationships between constructs.

## Results

An initial test of the measurement model revealed inadequate discriminant validity between the model constructs Ascription of the Responsibility and Personal Norms following the established

criteria (e.g. squared correlation between constructs was greater than the AVE for both constructs). Thus, we chose to drop the Ascription of Responsibility construct from the model. Although the relationship was hypothesized based on theory, some *post hoc* model modifications are often necessary in practice (McDonald & Ho, 2002). Results of the reduced model CFA ($\chi^2$ = 1911.8, $p$ < 0.01, df = 629; RMSEA = 0.057; CFI = 0.936; NNFI = 0.928) indicated that the data were an acceptable fit (Hu & Bentler, 1999) after dropping one item (nep6) due to a low factor loading (<0.4) (Fornell & Larker, 1981), and allowing two sets of indicator error terms to co-vary (nep1 and nep4; ws1 and ws2) (Byrne, Shavelson, & Muthen, 1989). A full report of CFA results is found in Table 1. All model constructs demonstrated acceptable reliability with values of Cronbach's Alpha and Composite Reliability above 0.7 (Raykov, 1997; Vaske, Beaman, & Sporanski, 2016). AVE and squared correlations among constructs are presented in Table 2. All constructs demonstrated acceptable discriminant and convergent validity expect Localism, which had a marginal value of AVE compared to commonly accepted standards (e.g. AVE > 0.5). However, we chose to retain the Localism construct in the model for three main reasons. First, the Localism construct is comprised of a variety of behaviors that range in ease of practicing (eating locally to hiring local guides). This means that the AVE will be likely lower than constructs measuring behaviors that have the same ease/difficulty of implementation or items designed to measure a specific attitude, belief or value. Second, this is one of the first applications of the VBN model to understand these types of behavior, and thus, they are central part of the motives for this investigation. Third, the measurement model, including this construct, demonstrated acceptable fit, and modification indices did not reveal mechanisms for improvement. It is noted, however, that improvements in the validity of the Localism construct are warranted.

Following the results of the measurement model, the hypothesized relationships among constructs were tested using structural equation modeling. Co-variances were estimated for the three exogenous latent constructs measuring values, and the three outcome variables measuring intent, respectively. Again, the results ($\chi^2$ = 2378.9, $p$ < 0.01, df = 761; RMSEA = 0.065; CFI = 0.914; NNFI = 0.907) indicated that the data were an adequate fit to the model following the recommendations of Hu and Bentler (1999). Personal Norms were found to predict (H7) Willingness to Sacrifice ($\beta$ = 0.56; $p$ < 0.01), (H8) Localism ($\beta$ = 0.47; $p$ < 0.01) and (H9) Eco-behavior ($\beta$ = 0.67; $p$ < 0.01). As hypothesized, we found support for the relationships between (H6) Awareness of Consequence and Personal Norms ($\beta$ = 0.65; $p$ < 0.01), and (H4) NEP and Awareness of Consequence ($\beta$ = 0.75; $p$ < 0.01). Our results also confirmed the hypothesized relationship between (H1) Biospheric Values and NEP ($\beta$ = 0.56; $p$ < 0.01). We did not, however, find support for the relationships between (H2) Altruistic Values and (H3) Egoistic Values and NEP. Finally, since Ascription of Responsibility was dropped from the model we did not find evidence to support its hypothesized relationships with Personal Norms or (H4) Awareness of Consequence. A summary of direct effects is presented in Table 3. Biospheric Values, NEP and Awareness of Consequence each exerted significant indirect effects (results omitted) on all subsequent constructs in the model. Altruistic and Egoistic Values were not found to have a significant indirect effect on any subsequent model constructs. The model demonstrated relatively high explanatory power with $R^2$ values ranging from 0.22 to 0.57 (Table 3).

## Discussion

This study sought to build on previous research exploring the psychological antecedents of tourists' engagement in PEBs in two main ways. First, the sustainable tourism literature has primarily explored behaviors conducted by tourists that mitigate their direct environmental impacts. In this study, we extend this literature to consider tourists' intent to consume local goods and services (Localism) and incur a cost to seek green products and services (Willingness to Sacrifice) as dimensions of "pro-sustainable behavior." The findings presented are an important step in re-conceptualizing PEB in the tourism context. Second, we hypothesized that three dimensions of pro-sustainable behavior were the result of the activation of tourists' altruistic values, beliefs, and moral obligations to minimize harm to other humans and the environment. To date, the majority of studies examining the

**Table 1.** Measurement model results. Standardized factor loadings reported.

| Construct | M (SD) | λ (SE) |
|---|---|---|
| Egoistic values $\alpha = 0.79$; $\rho = 0.79$ | | |
| ego1: Authority: the right to lead or command | 4.58 (1.40) | 0.75 (0.03) |
| ego2: Social power: control over others dominance | 3.51 (1.68) | 0.73 (0.03) |
| ego3: Influential: having an impact on people and events | 4.60 (1.43) | 0.78 (0.03) |
| Altruistic values $\alpha = 0.83$; $\rho = 0.84$ | | |
| alt1: A world at peace: a world free of war and conflict | 5.82 (1.21) | 0.76 (0.03) |
| alt2: Equality: equal opportunity for all | 5.88 (1.18) | 0.79 (0.02) |
| alt3: Social justice: correcting injustice, care for others | 5.57 (1.32) | 0.82 (0.02) |
| Biospheric values $\alpha = 0.90$; $\rho = 0.91$ | | |
| bio1: Unity with nature: fitting into nature | 5.44 (1.33) | 0.89 (0.01) |
| bio2: Protecting the environment: preserving nature | 5.57 (1.30) | 0.92 (0.01) |
| bio3: A world of beauty: beauty of nature and the arts | 5.60 (1.21) | 0.80 (0.02) |
| New ecological paradigm $\alpha = 0.85$; $\rho = 0.82$ | | |
| nep1: We are approaching the limit of the number of people the Earth can support | 4.50 (1.60) | 0.63 (0.03) |
| nep2: When Humans interfere with nature it often produces disastrous consequences | 5.41 (1.32) | 0.75 (0.02) |
| nep3: Plants and animals have as much right to exist as humans | 5.56 (1.38) | 0.70 (0.02) |
| nep4: The Earth is like a spaceship with very limited room and resources | 4.91 (1.53) | 0.73 (0.02) |
| nep5: The balance of nature is very delicate and easily upset | 5.30 (1.34) | 0.82 (0.02) |
| nep6: Humans were meant to rule over the rest of nature | 4.12 (1.70) | – |
| Awareness of consequence $\alpha = 0.95$; $\rho = 0.95$ | | |
| ac1: Carbon emissions from transportation (airplanes, cars, etc.) | 4.86 (1.50) | 0.86 (0.01) |
| ac2: Pollution of local environments | 4.84 (1.50) | 0.90 (0.01) |
| ac3: Destruction of native species' habitats | 4.99 (1.52) | 0.91 (0.01) |
| ac4: Waste (trash, sewage, etc.) coming from tourists | 5.12 (1.51) | 0.90 (0.01) |
| ac5: Water security and overuse | 4.86 (1.57) | 0.89 (0.01) |
| Ascription of responsibility | | |
| ar1: It is my responsibility to minimize my impacts on the environment as a tourist | 5.39 (1.35) | – |
| ar2: I feel jointly responsible for tourism impacts on the environment | 4.82 (1.58) | – |
| ar3: Minimizing my impacts on the environment is in part my responsibility | 5.03 (1.53) | – |
| Personal Norms $\alpha = 0.96$; $\rho = 0.96$ | | |
| pn1: As a tourist, I feel morally obligated to do whatever I can to minimize my environmental impact | 5.16 (1.46) | 0.89 (0.01) |
| pn2: I would feel guilty if I were responsible for damage to the environment as a tourist | 5.62 (1.32) | 0.84 (0.01) |
| pn3: Minimizing my impact on the environment is the right thing to do | 5.54(1.31) | 0.90 (0.01) |
| pn4: I am obligated to do my part to reduce my impact on the environment as a tourist | 5.37 (1.39) | 0.94 (0.01) |
| pn5: People like me should do what they can to minimize their impact on the environment when traveling | 5.51 (1.35) | 0.95 (0.01) |
| Willingness to sacrifice $\alpha = 0.97$; $\rho = 0.96$ | | |
| ws1: I am willing to pay more for travel if it helps the environment | 3.92 (1.66) | 0.91 (0.01) |
| ws2: I am willing to purchase environmentally friendly tourism products even if they may be more expensive | 3.94 (1.68) | 0.93 (0.01) |
| ws3: I am willing to use environmentally friendly means of transportation although this might take more time | 4.00 (1.66) | 0.90 (0.01) |
| ws4: I am willing to pay more to stay at environmentally friendly accommodations | 3.91 (1.71) | 0.95 (0.01) |
| ws5: I am willing to use environmentally friendly means of transportation although this may be more expensive | 3.86 (1.69) | 0.96 (0.00) |
| Localism $\alpha = 0.75$; $\rho = 0.75$ | | |
| loc1: Stay at locally owned accommodations | 4.59 (1.56) | 0.64 (0.03) |
| loc2: Eat locally sourced food | 5.47 (1.19) | 0.68 (0.03) |
| loc3: Hire local guide services/tour operators | 4.00 (1.78) | 0.63 (0.03) |
| loc4: Purchase locally produced crafts and goods | 5.21 (1.33) | 0.69 (0.03) |
| loc5: Purchase locally made alcohol | 4.54( 1.97) | 0.52 (0.04) |
| **Eco-behavior** $\alpha = 0.80$; $\rho = 0.80$ | | |
| eb1: Separate recycling from waste | 5.12 (1.72) | 0.72 (0.02) |
| eb2: Reuse bath linens during consecutive days stayed at Accommodations | 5.27 (1.69) | 0.53 (0.03) |
| eb3: Use eco-friendly tour operators | 4.17 (1.63) | 0.80 (0.02) |
| eb4: Use reusable shopping bags | 4.96 (1.68) | 0.75 (0.03) |

Note: $\alpha$ = Cronbach's alpha; $\rho$ = Composite reliability; $\lambda$ = Standardized factor loading; SE = Standard error; M = Mean; SD = Standard deviation; all factor loadings significant at $p < 0.01$.

psychological antecedents to PEB in tourism have adopted an expectancy-value lens, or taken an explicitly empirical approach to modeling behavior. The results of this study confirmed that the theoretically informed VBN model can account for substantive variance in tourists' intent to engage in pro-sustainable behaviors ($R^2 = 0.22$–$0.44$). Mirroring the findings of several recent studies (Han,

**Table 2.** Squared correlations between constructs and Average Variance Explained.

|       | EGO   | ALT  | BIO   | NEP  | AC    | PN   | WS   | E-B  | LOC  | AVE  |
|-------|-------|------|-------|------|-------|------|------|------|------|------|
| EGO   | 1.000 |      |       |      |       |      |      |      |      | 0.56 |
| ALT   | 0.03  | 1.00 |       |      |       |      |      |      |      | 0.61 |
| BIO   | 0.02  | 0.56 | 1.000 |      |       |      |      |      |      | 0.73 |
| NEP   | 0.00  | 0.24 | 0.35  | 1.00 |       |      |      |      |      | 0.51 |
| AC    | 0.02  | 0.18 | 0.24  | 0.49 | 1.000 |      |      |      |      | 0.78 |
| PN    | 0.00  | 0.26 | 0.44  | 0.36 | 0.34  | 1.00 |      |      |      | 0.81 |
| WS    | 0.12  | 0.13 | 0.26  | 0.19 | 0.23  | 0.22 | 1.00 |      |      | 0.84 |
| E-B   | 0.01  | 0.11 | 0.21  | 0.10 | 0.13  | 0.42 | 0.34 | 1.00 |      | 0.51 |
| LOC   | 0.18  | 0.05 | 0.10  | 0.07 | 0.04  | 0.00 | 0.12 | 0.00 | 1.00 | 0.40 |

Note: EGO = Egoistic; ALT = Altruistic; BIO = Biospheric; NEP = New Ecological Paradigm; AC = Awareness of Consequence; PN = Personal Norms; WS = Willingness to Sacrifice; E-B = Eco-behavior; LOC = Localism; AVE = Average Variance Explained.

Hwang & Lee, 2017b; Han, 2015), we found that the VBN model is potentially useful starting point for further work on PEB in tourism, especially as it pertains to changing and encouraging sustainable behaviors in tourism settings. We found that Biospheric Values had a direct relationship with one's environmental worldview, and an indirect relationship with Awareness of Consequence, Personal Norms and each of the three dimensions of pro-sustainable behavior. Following Stern et al. (1999), we can assert that Biospheric Values have a role to play in motivating pro-sustainable behaviors, and form the basis of psychological processes that underpin them. Individuals that hold a Biospheric Value orientation are more likely to posit that humans are a part of nature, possess an awareness that their actions may produce harm on others or the environment, internalize a moral obligation to stem that harm, and ultimately intend to engage in behaviors that seek to minimize it, even at a cost to the individual.

We did not, however, find a relationship between Egoistic or Altruistic Values and the NEP. This finding is consistent with some studies that have drawn on the VBN in the past, and raises some questions about the values basis of environmental concern (Stern & Dietz, 1994). van Riper and Kyle (2014), for instance, did not observe a relationship between Egoistic Values and the NEP. Kiatkawasin and Han (2017) and Han et al. (2017a) also failed to confirm the hypothesized relationship between Egoistic Values and the NEP. Similarly, Han (2015) hypothesized that only Biospheric Values were related to one's environmental worldview. However, some studies have confirmed this relationship (e.g. Wynveen et al., 2012). These studies represent only a handful in the literature that have tested the VBN model in a path analytic framework following the relationships hypothesized by Stern et al. (1999). It may be that Egoistic Values are not associated with one's environmental worldview, but rather, are related to alternative sets of beliefs that influence PEBs, or not. Regardless, more work is

**Table 3.** Summary of direct effects.

| I.V. →  | D.V. | $\beta$ (SE) | z-Value  | $R^2$ | Hypothesis              |
|---------|------|--------------|----------|-------|-------------------------|
| BIO     | NEP  | 0.56(0.07)   | 8.57***  | 0.43  | H1: Supported           |
| ALT     | NEP  | 0.11(0.07)   | 1.57     |       | H2: Not supported       |
| EGO     | NEP  | 0.02(0.04)   | 0.59     |       | H3: Not supported       |
| NEP     | AC   | 0.75(0.02)   | 34.01*** | 0.57  | H4: Supported           |
| AC      | PN   | 0.65(0.02)   | 26.27*** | 0.43  | H6$_{rev}$: Supported   |
| PN      | WS   | 0.56(0.03)   | 19.54*** | 0.32  | H7: Supported           |
| PN      | LOC  | 0.47(0.04)   | 12.43*** | 0.22  | H8: Supported           |
| PN      | E-B  | 0.67(0.03)   | 23.73*** | 0.44  | H9: Supported           |

$\beta$ = Standardized regression coefficient; SE = Standard error; BIO = Biospheric; ALT = Altruistic; EGO = Egoistic; NEP = New Ecological Paradigm; AC = Awareness of Consequence; PN = Personal Norms; WS = Willingness to Sacrifice; LOC = Localism; E-B = Eco-behavior; H5: was omitted following the elimination of Ascription of Responsibility from the model, H6 is revised hypothesis.

*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$.

needed to confirm and refine the values orientations that relate to the beliefs, norms and attitudes that underpin PEB.

It was found that the constructs Ascription of Responsibility and Personal Norms did not possess discriminant validity. This may have been an artifact of measurement that can be remedied with the use of different scales and items to operationalize the constructs, or may be indicative of problems underlying the theory. Stern et al. (1999), for instance, did not measure Ascription of Responsibility in their original work. Additionally, van Riper and Kyle (2014) found that Ascription of Responsibility explained 82% of the variance in Personal Norms, raising concern about the discriminant validity of these constructs in their model. Similarly, Raymond et al. (2011) and Landon et al. (2017) point out that past work using the Norm Activation Theory has found very high correlations between Ascription of Responsibility and Personal Norms (Steg & de Groot, 2010). Although empirical work has suggested that Awareness of Consequence is causally antecedent to Ascription of Responsibility, and that Ascription of Responsibility is the most direct predictor of Personal Norms, more work is needed to verify the measurement properties of these scales and whether or not it is beneficial to include both in future applications of the VBN. Meta-analysis, for instance, may be an appropriate tool for future research in this area.

The results of this study support our proposition that pro-sustainable behavior is reflected in more than just tourists' intent to engage in individual behaviors that limit environmental harm. We hypothesized that a Willingness to Sacrifice money and time to choose products that adopt a sustainable business model or mode of operation, or purchase goods and services from local sources are also reflective of pro-sustainable behavior. We found that these three dimensions were empirically distinct, and independently related to moral beliefs regarding sustainability. These findings parallel some scholars' calls for a more nuanced treatment of the multiple dimensions of PEB (Boley & Nickerson, 2013; Larson et al., 2015; Stern, 2000), and provide a starting point for further exploration in the context of sustainable tourism across the triple bottom line. With the "Localism" construct having a low AVE, future researchers may want to expand the "Localism" scale to see if different dimensions of local tourism behavior emerge. For instance, there may be differences between those prone to eat local food and stay at local lodging establishments. There is potentially more risk with local lodging because of the time spent at the lodging establishment and the cost of lodging compared to the small time and financial risk associated with eating at an unfamiliar local establishment.

### *Practical applications*

Sustainable tourists are coveted by destination marketers and mangers because of their high expenditures, propensity to stay longer within the destination, spend more locally, and create limited negative environmental, economic and social impacts (Lundie, Dwyer, & Forsyth, 2007; Nickerson, Jorgenson, & Boley, 2016; Woosnam, Dudensing, & Walker, 2015). The results from this study suggest that tourists that adopt pro-sustainable practices do so as a function of moral obligation (i.e. Personal Norms), which stems from values associated with care for the environment. While destination marketers and managers cannot necessarily change tourists' values within the destination, they can use this information in a number of ways.

First, practitioners seeking to change tourists' behavior within the destination, and foster sustainability, must design behavior change programs within the context of existing values orientations (Manfredo et al., 2016; van den Broek, Bolderdijk, & Steg, 2017). The VBN model provides an explanation for intrinsically motivated altruistic actions that benefit the environment and sustainability, and thus mechanisms for leveraging behavior change that activate existing cognitive structures. van Riper and Kyle (2014), for instance, suggest that the utility of the VBN is not in predicting behavior per se, but in modeling the cognitive processes that influence behavior, and therefore in identifying points of leverage for behavior change.

Although many tourism destinations offer incentives for tourists' adopting PEBs, extrinsically motivated behaviors do not persist in the absence of the incentive. van Der Linden (2015), in support of

this proposition, demonstrated that a student population engaged in a competition to conserve energy that was associated with a prize, immediately shifted energy use to pre-competition levels at its terminus. Although extrinsic rewards may motivate behavior in the short-term, they do little to change behavior in the long-run. Rather, appeals to morality, and messages framed in Biospheric values may influence the behaviors of tourists. Our results suggest that activating Biospheric values, beliefs and norms can lead to behavioral intent. Several studies have found that values-based persuasive communications can influence intent to engage in sustainable behaviors (e.g. van den Broek et al., 2017). More research is needed to determine the effectiveness of these approaches among tourists, but provides an interesting starting point. Targeted persuasive communication has the potential to activate travelers' moral obligations, which our model shows is likely to influence pro-sustainable behavior. Especially if these communications can target antecedent constructs like Awareness of Consequence.

Second, destination marketers and managers can target individuals with pro-environmental values through advertising campaigns and product development initiatives to attract them to their destination. For example, if a destination is able to identify a profile of travelers with Biospheric values, they can pinpoint their marketing efforts towards them in the hopes of attracting them so that they bring the anticipated positive (or limited negative) economic, social and environmental benefits to the destination. Alternatively, destinations should emphasize their commitments to environmental, social and economic responsibility to attract these consumers. Shared values have been shown to build loyalty (Chaney & Martin, 2017). Therefore, demonstrating a commitment to practices that reflect Biospheric Values may help to build trust and loyalty with consumers that hold these values themselves. Moreover, these types of programs have the potential to generate direct benefits for the environment and community.

### Limitations and future research

As with all research, limitations for the current study are worth discussing. Similar to most of the research employing the VBN within a tourism context (Han, 2015; Kiatkawsin & Han, 2017), our work stops shy of predicting actual behavior. Given temporal constraints of assessing values, beliefs, norms and actual behavior concurrently, others have mentioned this as a common critique of the VBN model (Lind, Nordfjarn, Jorgensen, & Rundmo, 2015), and attitude–behavior research more generally (Landon et al., 2016). With the existing effect sizes in the current model, it stands to reason that carrying the model forward to consider intentional measures of behavior would likely yield positive results in explaining actual behavior. This is an area for future research. Although refining the psychological antecedents of intent is important work, many scholars report the consistent gap between pro-social values and behavior (Kollmus & Agyeman, 2002). Future work exploring the relationship between intent and behavior will need to more explicitly consider the context that the behavior occurs in.

Subsequent studies employing the VBN model should consider amending the existing items used to measure Localism. As revealed from Table 3, the AVE for the Localism construct (though it exceeded the squared correlations with other constructs) was not greater than the suggested critical value of 0.50 (Hair et al., 2010). The AVE for the construct may potentially be low due to limitations in the items used (e.g. "purchase locally made alcohol" with its low factor loading), or low inter-item correlations stemming from differences in perceived sets of costs, benefits and constraints associated with each behavior independently. Considering the addition of alternative items (see, Lee & Moscardo, 2005) is one avenue to improve psychometrics (i.e. discriminant validity) for the localism construct, and is warranted for future work.

A further limitation of the existing study, deviating from numerous VBN-employed models, is that we removed Ascription of Responsibility. This was done given the threat to discriminant validity that developed. Subsequent work should continue to assess the role that this construct may play in the VBN model to either add credence to our findings or further support the initial (Stern et al., 1999) hypothesis. Furthermore, some scholars have raised concern regarding the coherence of the VBN

model more generally. Our failure to confirm the full model provides some support for these propositions. Kaiser et al. (2005), for instance, found that the TPB could better explain PEB than the VBN, and that the TPB was more parsimonious, and proved a better fit for the data in the context of their study. It is important to note, however, that the VBN and TPB are incommensurable in terms of the psychological process that they model, and therefore, comparing them may not be entirely fruitful as a means of theory development.

Like most theoretically derived models within the social sciences that rely on correlation and not causation, total variance (i.e. 100%) explained within the ultimate dependent variable is not attributed to the constructs used within the model. As such, a plethora of potential constructs may be considered within subsequent work. For instance, though the VBN theoretical framework considers Personal Norms, it discounts the role that social norms may play in contributing to sustainable behavior, as Oreg and Katz-Gerro (2006) have mentioned in similar research. Nigbur, Lyons, and Uzzell (2010) found that social norms significantly predicted Personal Norms within their cognitive–behavioral model. Additionally, with knowledge that some of the best predictors of future behavior are current or past behavior, future work may consider adding constructs to the model (as predictors) that measure previous sustainable tourism behavior, such as number of previous trips considered "sustainable," utilization of alternative modes of transportation in travelling to and within destinations (i.e. mass transit, carpooling, etc.), and patronage of eco-friendly lodging accommodations (Woosnam, Draper, Jiang, Aleshinloye, & Erul, 2018). Though our current model demonstrates acceptable fit and explains a high degree of variance in intentions to engage in sustainable tourism behaviors, refinements and extensions of the VBN model constructs may be fruitful. We caution scholars, however, to remain cognizant of the theory underpinning the VBN model when engaging in such work, as theory should dictate variables included in research not empirical expediency.

In conclusion, this study sought to test a model of tourists' intent to engage in behaviors that enhance the sustainability of tourism communities, environments and economies stemming from the activation of altruistic values. Determining the causes of PEB in the tourism context will assist in the development of mechanisms to encourage a more positive relationship between tourism activity and local communities, economies, environments and tourists. Tourism has the potential to be a positive force for both development and conservation, protecting local ecosystems and generating livelihoods for local people; however, the success of sustainable tourism ventures are, in part, dependent on the behaviors of tourists in the destination, and the willingness of tourists to be a force for good for local people and environments. Our results demonstrate that one effective way to account for tourists' pro-sustainable behavior is to acknowledge the moral normative influences on behavior and carefully consider them as avenues for fostering sustainability.

## Disclosure statement

## Notes on contributors

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how the unique natural and cultural resources of communities can be protected, packaged and marketed to jointly increase sustainability, resident quality of life and a community's competitiveness as a tourism destination.

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