

PRO-ENVIRONMENTAL BEHAVIOR
OF NATURE TOURISM OPERATORS IN TEXAS

A Dissertation

By

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ABSTRACT

As a key sector in tourism and outdoor recreation in the U.S., nature tourism has been contributing to local economic development. An important issue related to nature tourism management is nature tourism operators' pro-environmental behaviors (PEBs) that can essentially moderate tourists' experience and reduce the environmental impacts to the nature. A web survey collected data from tourism operators in Texas who work in the nature tourism segments of hunting, fishing, adventure tourism, and agritourism. The results indicate that the majority of eight classified PEBs were implemented by close to or over half of the nature tourism operators. Two behavioral theories – the *Theory of Reasoned Action* (TRA) and the *Value-Belief-Norm Theory of Environmentalism* (VBN) – were separately employed to analyze the survey data. Significant antecedents of PEBs were found from both models, while the TRA model was proven a better theory than the VBN model in more effectively interpreting nature tourism operators' PEB.

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CHAPTER I

INTRODUCTION

In comparison with the growing scholarship of pro-environmental behavior (PEB) of tourists, recreationists, and local residents in the sustainable tourism practice, understanding business operators' pro-environmental attitude and behavior has not been given the equal attention in the tourism and hospitality academia and profession, in particular in the nature tourism practice. Reflecting on the scarcity of nature tourism operator studies and the importance of filling such a research gap, this study was intended to summarize pro-environmental practices by nature tourism operators, and utilize established theories to quantitatively model their PEBs and antecedents.

“Tourism has been identified by the United Nations Environment Program (UNEP) as one of the ten economic sectors best able to contribute to the transition to a sustainable and inclusive green economy. This important initiative is about steering the industry onto a truly sustainable path – one that echoes to the challenge of our time: namely the fostering of a global Green Economy that thrives on the interest, rather than the capital, of our economically important nature-based assets.”

UN Under-Secretary-General and UNEP Executive Director Achim Steiner
(UNEP, 2015a)

As one of the fastest growing economic sectors in the world, tourism has undergone uninterrupted prosperity. The statistics for international tourist arrivals have indicated a substantial growth in the past decades from 25 million in 1950 to 278 million in 1980, 528 million in 1995, and almost 1.1 billion in 2013, with a projection of reaching 1.8

billion in 2030 (UNWTO, 2014). The exponential rise of tourism, much of which is highly dependent on the natural environment, has been called on to avoid the risk of “too much tourism killing tourism” (Budeanu, 2005, p. 89).

Accordingly, sustainable tourism – environmentally sound, economically viable, and socially responsible – has been widely adopted as a critical norm in guiding the economic development, protecting the natural environment, and improving the quality of life for communities that are largely reliant on tourism and hospitality industries. The *IOYFP Programme on Sustainable Tourism* advocates and emphasizes an integration of sustainable consumption and operation in tourism-related policies and frameworks (UNEP, 2015b). The preventative and proactive measures to minimize any negative impacts of tourism on local environments ought to be taken into account in managing local tourism development and operation.

Although the idea of adopting sustainable production patterns is nothing novel for industries, the tourism-operating sector is in the early stage of improving its environmental performance and behaviors (Tepelus, 2005). Mass tourism should take a leading responsibility for sustainable strategies, but the contemporary tourism industry practices show that mass tourism operators have not assumed such role until in the 2000s large tour operators started to “develop environmental policies and plans including green purchasing strategies, and environmental training for their staff” (Budeanu, 2005, p. 95). The trend is evident that big tour operators are promoting green strategies. Since then the top 10 European tour operators have started to integrate sustainability principles into operating activities (Budeanu, 2005).

Tourism is an industry where people interact with one another, tourists engage in societal cultures, and human activities and natural environment fuse together. Tourism activities are one of the most efficient manners of environmental education in which tourism operators play a vital role interpreting the surroundings and guiding the guests – the tourists – molding their attitudes and behaviors in tourism activities at a more responsible level (Budeanu, 2005). Tourists tend not to prefer tourism activities/products that are associated with lower environmental impacts and higher costs. Even in the context of nature tourism and ecotourism (a more specialized type of nature tourism) where alternative forms and personalized experiences are given great consideration, they tend to enjoy the consumptive activities in lieu of being reminded by tourism operators of their negative impacts on the vulnerable environment. Thus, the motivations and behaviors of a tourism operator are exemplary for tourists and visitors with respect to cultivating their pro-environmental behaviors. Furthermore, tourism operators need to optimize tourism products with a beautified “green” image and achieve profitability goal simultaneously.

Rooted in environmental psychology, pro-environmental behavior (PEB, a.k.a., environmentally significant behavior, or environmental responsible behavior) stemmed from a collection of theories that may be classified from an *impact-oriented* perspective regarding the resulting environmental impact reduction from less consumed materials or energy, as well as the creation of an *intent-oriented* perspective concerning the production of by-products of human hedonic desires and activities (Stern, 2000). Understanding the causal factors of PEBs [e.g., attitudinal factors, contextual forces, personal capabilities, and habits or routines (Stern, 2000)] and encouraging PEBs for

tourism operators increase significant values in environmental sustainability and tourism policymaking (Bamberg & Möser, 2007; Lucas et al., 2008; Steg et al., 2014; Steg & Vlek, 2009).

This research is undertaken in the context of nature tourism in Texas with a focus on nature tourism operators' PEBs. There are several significant meanings for conducting this research. First and foremost, nature tourism is capable of reducing social and environmental impacts from the tourists by providing alternative approaches to control tourists' activities (McKercher, 1998). Tourism operators are obligated to set limits on the number of visitors due to the carrying capacity of a tour area so as to protect the environment in a sustainable manner (McKercher & Robbins, 1998). Moreover, the limit-setting function is of particular significance to tourism operators working in ecotourism and other nature tourism segments. They have to satisfy a broad range of tourists from "hardcore" or "specialist" nature tourists at the high end to "casual" or "generalist" sightseeing visitors at the low end (Burton, 1998).

Second, nature tourism represents an emerging trend from the demand side (i.e., tourists) and a significant share of tourism-generated income from the supply side (i.e., tourism industries). McKercher (1998) noted that nature tourism develops faster than mainstream tourism from a general consensus, partly because some big tour operators are running nature tourism businesses. This is particularly evident in the tourism market of the U.S. and Texas. Nationally, the *2011 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation* estimates that "Americans spent \$145 billion on wildlife-watching gear, trips, licenses, land acquisition or leases, and other related expenditures, representing about one percent of the nation's gross domestic product" (U.S. Fish and

Wildlife Service & U.S. Census Bureau, 2014a, p. vi). When hunting and fishing are added to these figures, nationwide expenditures soar to \$234 billion (U.S. Fish and Wildlife Service & U.S. Census Bureau, 2014a). In the State of Texas, nature tourism has been fast growing in the tourism industry, the third largest industry in Texas (Texas Parks and Wildlife Department, 2001). In 2011, \$6.2 billion was spent on fishing, hunting, and wildlife-associated recreation (U.S. Fish and Wildlife Service & U.S. Census Bureau, 2014b). The growing nature tourism industry with increasing revenue from fishing, hunting, and wildlife-associated recreation is anticipated to continue to influence people's environmental perceptions and behaviors as they participate in these environment-reliant activities.

Third, nature tourism is an important realm of tourism studies, especially sustainable tourism research. However, it is one of the least studied areas in tourism literature (McKercher, 1998). One reason why it is understudied is that nature tourism businesses have a high dropout rate as this branch faces a number of challenges of maintaining its profitability. More specifically, seasonality of nature tourism activities, mobility of its employees, and a lack of holistic planning and marketing strategies account for the relatively high instability in comparison to mass tourism. Therefore, these issues have created difficulties in data collection for nature tourism studies thus resulting in the research void.

Last but not least, tourism research about the contribution of tourism to natural resource conservation and local community development has been largely confined to developing countries (Ingram & Durst, 1989; Moskwa, 2010; Tapper, 2001). The extent to which nature tourism professionals (e.g., nature tourism operators) promote

environmentally responsible behaviors through their managerial practices is yet to be explored and examined. A few exceptions of such exploratory or explanatory research include nature tourism operators' attitudes and actions about greenhouse gas emissions (Driscoll, Mansfield, & Strasdas, 2007; Lin, Yu, & Chang, 2018), ornithological tour operators' attitudes towards the environment and ecotourism (Jackson, 2007), Dutch outbound tour operators' participation in a product-oriented environmental management system (van der Duim & van Marwijk, 2006), influential factors affecting the adoption of environmental measures in small hospitality firms (Tzschentke, Kirk, & Lynch, 2008), and the role of adventure tour guides to reduce tourist's environmental impacts.

In addition, studies on tourism operators have been primarily focused on the managerial and marketing practices [e.g., for outbound operators (Budeanu, 2005; Curtin & Wilkes, 2005; Higgins & Drollete, 1994; Ingram & Durst, 1989; Tepelus, 2005) and inbound operators (Burton, 1998; McKercher & Robbins, 1998; Moskwa, 2010; Sirakaya & McLellan, 1998; Thomlinson & Getz, 1996; Weiler, 1993)]. An explanatory and timely study, rather than an exploratory investigation (e.g., Weiler, 1993; Weiler & Davis, 1993), on the PEBs of tourism operators exhibited in some sustainable operations (e.g., for this study, nature tourism operators in green operations) is necessary and beneficial for understanding the role of tourism operators with respect to natural resource conservation and environment degradation prevention in tourist areas (e.g., national and state parks, national and state forests, wetlands, coastal areas, all of which are ecologically sensitive and environmentally fragile).

The rest of this study is structured as follows. Chapter II sets the background by reviewing nature tourism and nature tourism operators' practices in green events and

other sustainable activities. It also summarizes research on pro-environmental behaviors (PEBs) by tour operators and incorporates PEBs in two theoretical frameworks – one based on the *Value-Belief-Norm Theory of Environmentalism* (VBN) (Stern, 2000; Stern et al., 1999) and supplemented by the *Norm-Activation Theory* (NAT) (Schwartz, 1973, 1977); and another synthesized from the *Theory of Planned Behavior* (TPB) (Ajzen, 1985, 1991, 2005) and the *Theory of Reasoned Action* (TRA) (Fishbein & Ajzen, 1975, 2010). Chapter III describes the data sources and the procedure for surveying nature tourism operators in Texas, provides the methods of measuring the study's independent and dependent variables, and identifies approaches for analyzing the data. Chapter IV reports the major analyses and hypothesis tests, whereas Chapter V describes the major research findings, research limitations, theoretical and policy implications, and directions for future research.

CHAPTER II

LITERATURE REVIEW

2.1 Nature Tourism

Tourism that involves activities in the natural environment is an important part of the travel industry both in terms of international and domestic visitors. The simplest way to define nature tourism was given as “tourism that features nature” (Priskin, 2001).

Reviewing the different perspectives of nature or nature-based tourism, Valentine (1992) noted that nature-based tourism is “primarily concerned with the direct enjoyment of some relatively undisturbed phenomenon of nature” (p. 108). Another definition of nature tourism explicitly revealed the linchpin of conservation – responsible travel to natural areas, which conserves the environment and improves the welfare of local people (Texas Parks and Wildlife Department, 2001). This type of travel behavior takes place through a variety of experiences, from active pursuits of outdoor recreation (e.g., mountain biking, hunting or fishing on public or private lands, rock climbing, diving) to more passive activities (e.g., viewing or enjoying natural ecosystems and wildlife or visiting a farm for educational or recreational purposes) (Gao, Schuett, & Phillips, 2011; HaySmith & Hunt, 1995; Priskin, 2001).

The scope of nature tourism has been so comprehensive and diverse that it includes ecotourism, adventure tourism, alternative tourism, green tourism, sustainable tourism, responsible tourism, ethical tourism, educational tourism, and aspects of cultural and rural tourism (McKercher, 1998; Priskin, 2001; Valentine, 1992; Weiler & Hall, 1992). More explicitly, Valentine (1993) discussed the fuzzy definition for ecotourism while listing 18 examples of a similar term – nature-based tourism (see Table 1, p. 108). Given

the diverse nature of the subcategories of nature tourism, the aforementioned tourism activities share a few commonalities including being nature dependent, outdoor-oriented, non-mass tourism (McKercher, 1998; Valentine, 1992 & 1993).

Moreover, Valentine (1992) illustrated the complexity of nature tourism by providing a three-dimension (i.e., experience, style, and location) taxonomy (see Table 9.1, p. 109). Understanding the specific categories of experience, style, and location for nature tourism activities is critical in tourism destination marketing, planning, and management as well as studying nature tourism phenomena.

More recent research on nature tourism suggested visitor-based typologies that there exist various tourist motivations and market orientations rather than the misleading assumption held by previous studies that all nature based tourists are a single homogeneous group (Mehmetoglu, 2007a, 2007b). Hvenegaard (2002) recommended four empirical categories of nature tourism typology studies – researcher-based, respondent-based, motivation-based, and activity-based. The activity-based approach focuses nature-based tourists around trip activities and reflects a changing nature of such tourists, which is distinct from the *a priori* orientations of existing literature on nature tourist typologies. By investigating trip activities and daily expenditures of visitors at two nature-based attractions in Northern Norway, Mehmetoglu (2007a, 2007b) identified two typologies of nature-based tourists. One was differentiated by their trip motivations – nature, physical activities, novelty/learning, mundane every day, social contact, and ego/status. The other was obtained through an analysis of trip activities of these nature-based tourists and concluded with four groups of activities – visiting historic/cultural activities, challenging nature-based activities, relaxing nature-based activities, and

pleasure-based activities. Arnegger, Woltering, and Job (2010) further added a second dimension to the tourist-based typology – service arrangements (the supply side of the nature tourism industry market) – in a continuum of independent, á la carte, customized, and fully standardized which intersected with the well-defined dimension of “nature as point of attraction”, including nature protection, nature experience, sports and adventure, and hedonistic experience (see Arnegger et al., 2010, p. 923, Figure 1). In accordance with the demands of nature tourists, tourism operators and hospitality providers will have to segment the nature tourism market with custom-built services.

As the definition and classification of nature tourism have been inconsistent across studies, the differences between nature tourism and a few relevant terms require some clarifications here. First, people seem to be confused about the concepts of ecotourism and nature tourism. In fact, both of them are categorized as alternative tourism out of the domain of mass tourism. As travelers are expecting higher end products from tourism, ecotourism and nature tourism, which are often interchangeably used (Hvenegaard, 1994; Mehmetoglu, 2007a), provide the corresponding activities and experiences. Luzar, Diagne, Gan, and Henning (1998) deemed several terms as alternative representations of ‘nature tourism’, including nature-based tourism, green tourism, and ecotourism, and emphasized the growing economic importance of ecotourism. Their definition is consistent with the one proposed by Valentine (1993) focused on nature dependency and protection while enjoying it. However, those two forms of tourism are perceived distinguishable by other researchers. Ecotourism receives more attention regarding education and the non-negative environmental impacts from tourism while nature-based tourism highlights tourism resources that people are interacting with. Björk (2000) argued

that ecotourism is a unique tourism form that differs from nature tourism, adventure tourism, and farm tourism. Others have simply argued that ecotourism is a subset of nature tourism (Burton, 1998; Ditton, Holland, & Anderson, 2002; Fennell, 2007; Goodwin, 1996; Priskin, 2001). This perspective stemmed from a very broadly defined understanding of nature-based tourism – “tourism that features nature” (Priskin, 2001) – so that ecotourism, as well as adventure tourism and aspects of cultural and rural tourism, is placed underneath the overarching label of nature tourism. Another more inclusive inclination has been to combine several interrelated forms of tourism – nature-based tourism, ecotourism, adventure travel, and outdoor recreation – and create a new sub-sector of tourism, namely NEAT (nature, eco- and adventure tourism) for the benefits of marketing, operation, and conceptualization (Buckley, 2000). Not necessarily required to have an education component in ecotourism, NEAT could opt to “incorporate best-practice environmental management”, “an education component or a contribution to conservation” (Buckley, 2000, pp. 438-439). The debate of whether ecotourism ought to be interchangeable with nature tourism has gone for years in the tourism research society and ecotourism, or say, nature tourism, is still a developing field in need of being better defined (Weaver & Lawton, 2007). For this dissertation research about Texas nature tourism business operation in relation to pro-environmental behaviors, ecotourism is considered as a more specialized type and a sub-segment of nature tourism which could take place in any of the four types of nature tourism operations (i.e., fishing, hunting, adventure tourism, and agritourism).

Second, the distinction between nature tourism and outdoor recreation is flexible with quite a few claims of no difference [see the following discussion from HaySmith &

Hunt (1995)]. Hunting and fishing are the overlaps between these two types of activities, but several differences are as follows. Nature tourism is generally operated as group activities part of an organized tour by tour guides and/or tourism operators while recreationists can travel individually or in smaller groups without any external assistance. Furthermore, various hospitality infrastructure, facilities, and services are needed for nature tourists in coordinated group activities. Nature tourism engages tourists in educational and learning experiences about the natural environment, whereas outdoor recreation expects personal physical contact with the environment.

Although there has not been a consensus on the definition of nature tourism or nature-based tourism (Arnegger et al., 2010; Hvenegaard, 1994; Mehmetoglu, 2007a), the hedonistic and experiential functions as well as the environmental conservation and education purposes are adopted by this empirical research on nature tourism operators' pro-environmental behaviors in four major categories of nature tourism operations in Texas – fishing, hunting, adventure tourism, and agritourism (Texas A&M Agrilife Extension's Nature Tourism Program, 2015).

2.2 Nature Tourism Operators

2.2.1 Nature Tourism Operators

Nature tourism is a major economic engine for agricultural properties, businesses and local communities and usually involves both the public and private sectors. It makes solid economic contributions to the destinations no matter they are international tourist hubs or domestic hotspots. For instance, one third of Rwanda's foreign exchange revenue was from nature-based tourists seeing gorillas in the Volcans National Park (Valentine,

1992). In the U.S., Texas is a well-known destination for nature tourists. Nature tourism in Texas made a \$26.8 billion contribution to the 2012 state GDP, only following oil and gas production and related manufacturing (Texas A&M Agrilife Extension's Nature Tourism Program, 2015). In addition to the economic contribution, the nature tourism industry also plays a significant role in the interplay of natural environment and nature tourism landscape (Higgins, 1996). Whether nature tourism businesses undertake a pro-environmental approach in their daily operations and tours makes a distinct difference in maintaining the ecological integrity of the natural environment and sustaining the green industry (i.e., nature tourism) economically.

There is a plethora of literature on nature tourism activities and visitors; yet there is a lack of research investigating "either the global or business organization of the nature tourism industry" (Higgins, 1996, p. 11). Tour operators play a pivotal role in the nature tourism industry as intermediaries between tourists (reducing their information and transaction costs) and tourism service providers (reducing their promotional expenditures) (Sheldon, 1986). They work as the vital links between the supply (tourism attractions) and the demand of tourism services (potential visitors) (Ingram & Durst, 1989; Tepelus, 2005). Tour operators not only facilitate tourism activities and direct tourist scales at the tour area, but also influence the associated subsectors in the tourism industry (e.g., lodging and accommodation) (Tapper, 2001). The sustainability of tourism industry is largely dependent on the tour operators whose private firms have to cater to the public's increasing awareness of and interest in corporate social responsibility (CSR) (Frey & George, 2010; Lin et al., 2018) and while sustaining their business financially, environmentally, and socially (van Wijk & Persoon, 2006).

The tourism literature tends to profile characteristics of tourism/tour businesses and/or operators as background information, but barely focuses on the business aspects of these enterprises. The significant role of tourism operators in the packaged tourism practice and the relevant hospitality industries strongly underscores the need for research on tourism operators, which is currently much understudied from tourism management and business administration disciplines. Some research has examined compliance with ecotourism guidelines (Sirakaya, 1997), number of businesses and clients served (Higgins, 1996), the ethical nature of businesses (Fennell & Malloy, 1999), and socio-demographics of the operators (Sirakaya, 1997). More recent research at a state level has examined the feasibility of setting up agritourism businesses in North Dakota (Tweeten, Leistriz, & Hodur, 2008), training needs of employees in rural tourism businesses in West Virginia (Ohnoutka & Hughes, 2002), effects of urban sprawl and visitor activities on agritourism in North Carolina (Kline, Cardenas, Leung, & Sanders, 2007) and training for income diversification for landowners in Mississippi (Jones, Jacobs, Yarrow, & McPeake, 2008). In the business operation aspect, how nature tourism businesses address ecotourism issues with an environmental conservation ideology was an important research priority emphasized in order to understand tourism operator behaviors and nature tourism operations (Higgins, 1996).

Nature tourism operators, along with lodge operators and outfitters, are one of the major stakeholders in the overall tourism *Ecotourism Opportunity Spectrum* (ECOS) (Boyd & Butler, 1996). They work closely with public policy decision makers and resource-based industry on developing the social infrastructure and naturalness base of the ecotourism framework (Boyd & Butler, 1996). They can influence the behavioral

choices of tourists, the practices of suppliers, and the development patterns of destinations. Cohen (1985) differentiated the tour guide's roles with a two-dimensional matrix – outer-directed/inner-directed natures interacted with leadership/mediatory spheres (see Figure 1, p. 10). Note that Cohen's discussion on tour guide can be expanded to nature tourism operators as they play the same roles as a tour guide but also maintain additional managerial functions. They lead the tours and communicate with tourists to achieve the instrumental primacy, social primacy, interactionary primacy, and communicative primacy.

Weiler and Davis (1993) advanced on Cohen's assertions by emphasizing a third function involving resource management to the matrix (see Figure 2, p. 97). As leaders in nature tourism, operators have two additional roles – “motivator (the modification of tourist behavior and impacts on-site)” and “environmental interpreter (the understanding and appreciation of environmental issues to facilitate responsible tourist behavior in the long term)” (Weiler & Davis, 1993, p. 97). Nature tourism operators are required to be pro-environmental in their operation on the natural sites and during their tours teach awareness of environments, demonstrate how to maintain environmental integrity, and learn to engage in pro-environmental behaviors. Examples of long-term environmental behavioral changes include participation in environmental policy-making and planning, engagement in user-pay systems, and contributions to conservation and scientific research, as defined in the “deep green” tourism arena (Weiler, 1993).

Generally, tour operators fail to avoid negative impacts from their activities unless quick economic benefits were perceived, such as savings of costs from energy and enhancement of public image. However, some tour operators play significant roles in

enacting principles of sustainability into practice (Tepelus, 2005). Specifically, they play significant roles in shaping and affecting attitudes and behaviors towards responsible and sustainable tourism (Budeanu, 2003). They can create and shape the destination image in their roles as significant and impactful players, especially influencing international tourists' perceptions of countries with security and societal risks (Cavlek, 2002).

Since the tour operator is a vital player in nature tourism in terms of initiating, marketing, organizing, and facilitating the nature-dependent tourism activities, studying their environmental intentions and behaviors will, on one hand, largely benefit the development of sustainable tourism activities and events. On the other hand, understanding environmental ethics, forming conservation-based philosophies, and operating green and sustainable tours are critical for nature tourism operators to resolve the dilemma of utilizing natural resources while ensuring the environmental sustainability and ecosystem integrity (McKercher, 1998). Nonetheless, these remain a research void in both nature tourism (or the more restrictive, ecotourism) and outdoor recreation literature to investigate nature tourism operators' pro-environmental behaviors to enhance the environmental sustainability. An inherent difficulty for such empirical studies is the "small business" nature of nature tourism operations, which is confronted by "highly seasonal and volatile operating conditions, lack of brand awareness, severe price competition and locations a great distance from main markets" (McKercher, 1998, p. 6).

2.2.2 Nature Tourism Operators in Texas

In this empirical study, nature tourism operators in Texas are selected to study their pro-environmental behaviors in providing professional services of hunting, fishing and

two growing areas – adventure tourism and agritourism. The service categories correspond to the Texas A&M AgriLife Extension’s missions and goals (Texas A&M Agrilife Extension’s Nature Tourism Program, 2015). Hunting and fishing are consumptive wildlife tourism/recreational activities that may pertain to less environmental concerns than appreciative activities (e.g., hiking, camping, and nature photography) (Luo & Deng, 2008; Reynolds & Braithwaite, 2001). However, fishing is one of the most popular and easily accessible recreational activities in the U.S. (Ditton et al., 2002) and similarly in the State of Texas (Schuett, Gao, Shingote, Kyle, & Dudensing, 2012). In addition to the pleasure-garnering function, recreational fishing is an ecotourism-oriented approach to promote a respect for nature by protecting and sustaining fish populations in the localities (Ditton et al., 2002). Compared to fishing, hunting often requires further travel from urban environments to remote countries as wildlife resources are diminishing and receding (Bauer & Herr, 2004). Also, the expense of a hunting trip could be much more expensive than a trip for fishing. Hunting tourism management requires hunting operators to incorporate “a consistent, long-term, objective research component, and the legislative and practical means for implementation through a responsible and well-trained group of hunters” (Bauer & Herr, 2004, p. 67). Extension services from research universities (e.g., Texas A&M AgriLife Extension’s Nature Tourism Program) and other intermediates make hunting operators aware of research and how it can be used in their businesses. In the business online inventory offered by the Texas A&M AgriLife Extension’s Nature Tourism Program, 394 fishing and 471 hunting operations are listed reflecting a fraction of the businesses in Texas (Texas A&M Agrilife Extension’s Nature Tourism Program, 2015).

Compared to these two traditional nature tourism activities, adventure tourism, or adventure recreation, being a niche marketwise with risk as a central role, started to grow fast recently and attract academic research from late 1980s (Weber, 2001; William & Soutar, 2009). Adventure tourism encompasses a wide variety of activities [see Weber (2001), p. 365, Table 1 and Buckley (2006), pp. 27-28, Table 3.2]. Buckley (2010) grouped them into four subsectors – wildlife, marine, boardsports, and heliskiing. Adventure tourism is comprised of two distinguishable types – high-volume specialist (requesting prior skills in the relevant activity) and low-volume generalist (tourism operators making it accessible to unskilled clients) (Buckley, 2006). A number of recognized adventure tourism activities cover a similar range as do the aforementioned typologies, including hiking, paddling, mountain biking, off road vehicles, rafting, birdwatching and wildlife viewing, photography, stargazing, swimming, and camping/tent/RV, operated by 975 adventure tourism businesses representing a fraction of all in Texas (Texas A&M AgriLife Extension’s Nature Tourism Program, 2015).

Tourism activities and events vary from large scale (international or national) to small scale (regional/local). Tourism operators include not only mega event operators, but also individual farmers, farmer families, or winery and plantation owners. Many agritourism businesses are small agricultural operators who generally identify themselves as farmers and ranchers rather than tourism operators (Sharpley & Vass, 2006). Agritourism literature discussed the transition from tourism on the farm (as a supplemental commercial activity that generates additional revenue to agriculture) to farm tourism (creating benefits from diversification into tourism in terms of immediate additional income and long-term security in farming) (Busby & Rendle, 2000; Sharpley

& Vass, 2006). Agritourism, based on a review of relevant literature, has several interchangeably used terms, such as agrotourism, farm tourism, farm-based tourism, and rural tourism (Phillip, Hunter, & Blackstock, 2010). The demarcation between agriculture and agritourism is getting hazier and weaker (Busby & Rendle, 2000; Fleischer & Tchetchik, 2005). In Texas, agritourism is presented by a wide variety of activities – “nature tours, overnight stays, horseback riding, pick-your-own produce, educational classes, and visiting the farm store” – in which farmers and ranchers invite tourists to their properties to participate (Bonham, 2011). As a part of the businesses in Texas, 437 agritourism operations are listed in the business inventory of Texas A&M AgriLife Extension’s Nature Tourism Program (2015).

2.3 Pro-environmental Behavior of Nature Tourism Operators

The pivotal theme of this research is to investigate tourism operators’ *pro-environmental behaviors* elicited in their business operations of nature tourism activities (including but not limited to hunting, fishing, adventure tourism, and agritourism). A few terms have been interchangeably used from the disciplines of environmental psychology, social psychology, and social sciences like tourism and hospitality to note such individual or collective behaviors – environmental behavior (Poortinga, Steg, & Vlek, 2004), environmentally significant behavior (Serenari, Leung, Attarian, & Franck, 2012; Stern, 2000), responsible environmental behavior (Hines, Hungerford, & Tomera, 1986/87), environmentally responsible behavior (Cheng, Wu, & Huang, 2013), environmentally friendly behavior (Scott & Willits, 1994), and pro-environmental behavior (Bamberg & Möser, 2007; Barber, Kim, & Barth, 2014; Halpenny, 2010; Lucas, Brooks, Darnton, &

Jones, 2008; Mair & Laing, 2013; Steg, Bolderdijk, Keizer, & Perlaviciute, 2014; Steg & Vlek, 2009). Rooted in environmental psychology, the definitions of pro-environmental behavior (PEB) stemmed from a collection of theories classified from an *impact-oriented* perspective regarding the resulting environmental impact reduction from less consumed materials or energy, as well as an *intent-oriented* perspective concerning producing a by-product of human hedonic desires and activities (Stern, 2000). This study follows the *intent-oriented* perspective and studies PEBs that nature tourism operators adopt and implement in the State of Texas.

Although limited research was found in investigating tourism operators' PEBs in nature tourism or the more restrictive ecotourism sector (e.g., Jackson, 2007; Serenari et al., 2012; Sirakaya & McLellan, 1998; Sirakaya & Uysal, 1997; Wight, 1993), PEB studies on tourism operating businesses (Andereck, 2009; Tepelus, 2005; van der Duim & van Marwijk, 2006), hospitality management (Dewhurst & Thomas, 2003; Tzschentke, Kirk, & Lynch, 2008), and tourism events (Barber et al., 2014; Boo & Park, 2013; Getz, 2009; Laing & Frost, 2010; Mair & Laing, 2013; Park & Boo, 2010) shed light on a series of advocated and/or operated sustainable practices. The pro-environmental attitudes, motivations, impediments, and intentions identified by the aforementioned studies in the relevant tourism and/or hospitality sectors were tested and found to be consistent in predicting PEBs under the corresponding contexts. Since the scarcity of nature tourism operator studies that used PEBs and the commonality of sustainable development goals in tourism and hospitality industries in these relevant areas, the PEBs examined in this research are generated from a variety of studies that reflect the tenet of environmental conservation.

First, *waste management* is an effective environmental protection strategy that has been widely practiced by adventure tour guides to pack out rubbish and bury human waste in a Himalayan mountainous area (Serenari et al., 2012), small Scottish hospitality businesses to compost food and garden waste (Tzschentke et al., 2008), Dutch tour operators to separate types of waste (van der Duim & van Marwijk, 2006), tourism businesses in Arizona to compost human waste in toilet systems (Andereck, 2009), UK ornithological tour operators to neither have litter and organic material disposed onsite nor use non-biodegradable products during a tour (Jackson, 2007), and small tourism firms to reduce waste within their operation and compost organic waste in a UK national park (Dewhurst & Thomas, 2003). Waste reduction attenuates the negative impacts of visitors on the ecologically fragile and environmentally sensitive areas and also improves the site image for tourism attractions by the sustainable operation of the packaged tours.

Second, a related PEB to waste management from the tourism operation is *recycling and energy conservation*, which reduces the waste from unwanted items (e.g., glass, bottles, paper, cardboard, maps, trail guides, etc.) (Andereck, 2009; Serenari et al., 2012; Tzschentke et al., 2008), reuses materials [e.g., running grey-water systems (Andereck, 2009), reusing leftover toiletries and foil and paper (Tzschentke et al., 2008)], reduces the use of water, power, and energy (van der Duim & van Marwijk, 2006), and adopts energy efficient systems, renewable energy systems, and items made of recycled materials (Andereck, 2009; Dewhurst & Thomas, 2003; Tzschentke et al., 2008). These good practices not only lower the environmental impact from nature tourists but also generate financial benefits (Dewhurst & Thomas, 2003). Third, a broader category of *natural resource conservation* represents another PEB trend in tourism sites and facilities. To

preserve the existing natural ecosystem and minimize exploiting the natural resources, tour activities, such as cutting living trees for firewood (Serenari et al., 2012) and walking on moors, dunes, and vegetation that causes footprint erosion (Dewhurst & Thomas, 2003; Jackson, 2007), are avoided by tour guides and local tourism businesses.

Fourth, *responsible purchasing* has been adopted by tourism businesses to be accordance with the sustainability practices. Dewhurst and Thomas (2003) found that ‘committed-actors’ tourism businesses in a UK national park were committed to using local suppliers, purchasing organic and environmentally responsible products, and questioning suppliers about the offered products. Tzschentke et al. (2008) also learned that purchasing ethical and environmentally friendly products was implemented as one of the ‘going-green’ environmental management practices by the UK hospitality businesses.

Fifth, tourism operators are influential in *selecting low-impact transport* that connect and facilitate nature tourists’ exploratory and recreational activities. Transport-related problems have been revealed by the high car dependency for tourists travelling to and within a nature tourist area, especially somewhere ecologically vulnerable and environmentally sensitive (Dewhurst & Thomas, 2003). Thus, to reduce environmental pollutions by exhaust gas and noise, it is highly suggested that nature tourism operators and businesses commit to a reduction in the use of personal transportation (Tepelus, 2005), provide information on public transport, walks, and cycle routes (Tzschentke et al., 2008), and encourage visitors to take environmentally friendly transport (e.g., public transport and ride sharing) (van der Duim & van Marwijk, 2006) between the transport hubs (e.g., airport, seaport) and the tourist areas. Sixth, *suggesting environmental friendly accommodation* is essential to the nature-based tourism success of the ‘green’ goal of

environmental conservation. Oftentimes, tourism operators worked with accommodation owners and/or agents on designing tours (Tepelus, 2005) and promoting environmentally friendly facilities for lodging (van der Duim & van Marwijk, 2006). However, an investigation on bird watching tour operators showed they tended to only mildly agree that accommodation facilities could be located close to tourist areas, such as major wildlife sites (Jackson, 2007). Additional empirical studies on using environmental criteria to recommend pro-environmental accommodation facilities are needed to examine to what extent nature tourism operators have agreed and/or practiced on this issue.

Seventh, several formats of *environmental communication* have verified the willingness and intention of tourism operational businesses to promote low-impact environmental behaviors for tourists and the associated staff. Environmental training for tour guides and facility operators is widely accepted and practiced by large and small operational services in the tourism and hospitality industries (van der Duim & van Marwijk, 2006; Tepelus, 2005; Tzschentke et al., 2008). Dewhurst and Thomas (2003) revealed a perceived gap by tourism firms between local conservation projects and their business because of being unaware of such projects and lacking time to get involved. Thus, to inform staff about current environmental policies and projects at the local level via regular training endeavors is crucial for enhancing and updating tourism businesses and operators about environmental conservation. Aside from training tour guides and business operators, informing and educating tourists and visitors before, during, and after the tour is of equal importance in order to implement the pro-environmental actions and behaviors. The means of this type of environmental communication include but are not

limited to providing ‘green’ information folders or visitor notice boards (Dewhurst & Thomas, 2003), communicating environmental management systems and policies to customers during the visit (Tzschentke et al., 2008; van der Duim & van Marwijk, 2006), and producing and providing information leaflets, brochures, and handbooks for travelers (Tepelus, 2005).

Last but not least, *donating to environmental entities* by tourism businesses is contributing to the community-level environmental sustainability. The donation can be made possible through paying organizational membership fees to environmental charities (Tzschentke et al., 2008), contributing to local non-profit conservation initiatives (Jackson, 2007), or donating a portion of the revenue to a public tourism management agency with policies and projects to conserve the ecosystem and promote local development (Tepelus, 2005).

In sum, the PEBs reviewed above are incorporated into an Internet-based questionnaire survey for nature tourism operators in Texas to explore and justify the antecedents of these PEBs through a modified environmental psychology model discussed as follows.

2.4 Antecedents of Pro-environmental Behavior

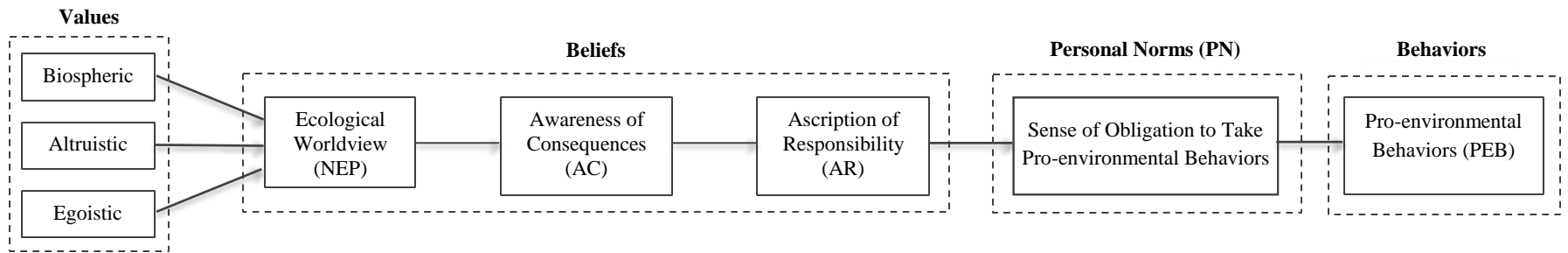
Understanding the causal factors of PEBs and encouraging PEBs for nature tourism operators can lead to significant values in environmental sustainability and tourism policymaking. This study utilizes the environmental psychology model, the *Value-Behavior-Norm Theory of Environmentalism* (VBN) (Stern et al., 1999; Stern, 2000), and the improved behavioral model, the *Theory of Reasoned Action* (TRA) (Fishbein &

Ajzen, 1975, 2010), concerning both self-interest motives from the *Theory of Planned Behavior* (TPB) (Ajzen, 1985, 1991, 2005) and pro-social motives from the *Norm-Activation Theory* (NAT) (Schwartz, 1973, 1977), and proposes a pair of conceptual models applied in a PEB study of nature tourism operators (Figure 2.1). The study is intended to draw on theoretical models from environmental psychology in general and PEB studies in specific, contextualize it with the nature tourism sector with modifications, and empirically test the conceptual models by surveying the PEBs adopted and practiced by nature tourism operators in managing their businesses.

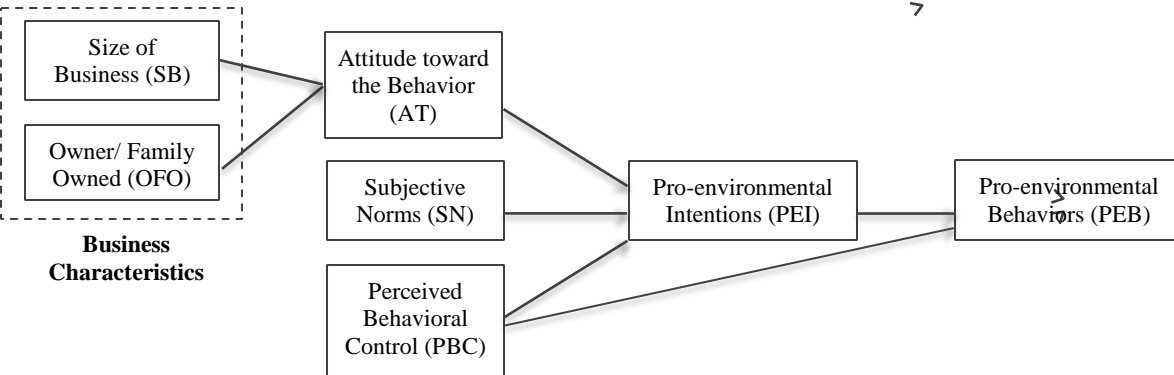
2.4.1 Theory of Planned Behavior and Theory of Reasoned Action

In a meta-analysis of PEB's determinants (Bamberg & Möser, 2007), an updated literature review 20 years later following Hines et al. (1986/87), a dichotomy of research orientations was presented – self-interest and pro-social motives. The studies that considered PEB primarily self-interest motivated were developed from the model of *Theory of Planned Behavior* (TPB) (Ajzen, 1985, 1991, 2005) and its predecessor, *Theory of Reasoned Action* (TRA) (Fishbein & Ajzen, 1975, 2010). TRA states that behavioral intention is an immediate antecedent to behavior that indicates “how hard people are willing to try, of how much of an effort they are planning to exert, in order to perform the behavior” (Ajzen, 1991: 181). Intention can be directly predicted by attitude toward the behavior [AT, “the degree to which a person has a favorable or unfavorable evaluation or appraisal of the behavior in question” (Ajzen, 1991: 188)] and subjective norms [SN, “the perceived social pressure to perform or not to perform the behavior” (Ajzen, 1991: 188)], while TPB adds a third variable – perceived behavioral control

VBN Model



TRA Model



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Figure 2.1 Conceptual models using TRA and VBN theories

[PBC, “the perceived ease or difficulty of performing the behavior” (Ajzen, 1991: 188)] – to predict the performance of behavior directly and indirectly through behavior intention. Fishbein and Ajzen (2010) revised TRA to a more comprehensive framework (see Figure 1.1, p. 22) that enclosed background factors as primary predictors of the three types of beliefs and actual control as a reliable moderator of the effect of intentions on behavior.

In the applications of the two interrelated theoretical theories (TPB and TRA), various individual behaviors have been empirically tested in the studies of tourism and outdoor recreation. Ajzen and Driver (1991 & 1992) employed the TPB/TRA in a college student survey about their involvement and choices in five leisure activities (i.e., spending time at the beach, jogging or running, mountain climbing, boating, and biking). The three measures of beliefs (behavioral beliefs, normative beliefs, and control beliefs) significantly influenced leisure participation intention and behavior both directly and indirectly through AT, SN, and PBC (Ajzen & Driver, 1991, 1992). In the event tourism and hospitality literature, TPB has been a successfully applied theoretical framework to examine the environmental friendly practices (a.k.a., green behaviors) of convention/event organizers, meeting suppliers, business travelers, and festival travelers (Barber et al., 2014; Han & Kim, 2010; Park & Boo, 2010).

Several empirical studies in the outdoor recreation area employed TPB/TRA to fathom the natural resource-related recreationists’ behaviors (e.g., hunting, wildlife viewing) (Daigle, Hrubes, & Ajzen, 2002; Rossi & Armstrong, 1999) and local residents’ PEBs to reduce the impacts from climate change (van Riper, Kyle, Sutton, Yoon, & Tobin, 2013; Yoon, Kyle, van Riper, & Sutton, 2013). A recent park visitor study

investigated determinants of their willingness to pay for park conservation by using both TPB and VBN models (López-Mosquera & Sánchez, 2012). In comparison with VBN, TPB rendered better explanatory power for willingness to pay. In the nature tourism operator study, TPB will be employed to validate the hypothesized causal relationships between the PEB and the antecedents (including AT, SN, and PBC) via the mediation of pro-environmental intention (PEI).

In line with the background factors in the revised TRA model (Fishbein & Ajzen, 2010), nature tourism operators' pro-environmental attitudes are anteceded by the business characteristics in two aspects. Similar to most businesses in the tourism industry (Thomas, 2000), nature tourism businesses are dominated by small and medium sized enterprises in the private sector (Dewhurst & Thomas, 2003; McKercher, 1998; McKercher & Robbins, 1998; Thomas, Shaw, & Page, 2011; Weaver & Lawton, 2007). Most of these entities are operated by owners and families (Getz & Carlsen, 2000) and are marginally viable in maintaining the business and hiring staff (McKercher & Robbins, 1998). The tour operator industry comprised of small firms runs the business poorly and tour operators are prone to financial failure (Sheldon, 1986). Thus, a high failure/attrition rate has been observed in small nature-based tourism (or ecotourism) businesses (McKercher & Robbins, 1998). Seeking to survive the start-up stage financially, nature tourism businesses tend to compete in the market by lowering prices and standards and thus threaten the natural environment in which nature tourism activities take place (Getz & Carlsen, 2000). Although promotional benefits are apparent to tourism operators in getting involved in the green activities of ecotourism (Wight, 1993), the attitudinal barriers to environmentalism also hinder their behavioral compliance with

sustainable tourism principles, policies, and agendas (Sirakaya & McLellan, 1998; Thomas et al., 2011; van Wijk & Persoon, 2006). In this nature tourism operator survey, size of business and being family/operator owned was explored to elicit the linkage between the business background characteristics and the attitudes in adopting and implementing PEBs.

This study made an underlying assumption that tourists and tourism operators share some common perceptions of and attitudes towards PEBs in nature tourism practice. Thus, the application of the TRA model to tourists and recreationists was expanded into examining nature tourism operators' PEBs. This was evidenced by an empirical study comparing the attitudes towards the New Ecological Paradigm (NEP) scale between tourists and tourism enterprise operators (Imran, Alam, & Beaumont, 2014). Given this assumption and the acceptance of utilizing the TRA theory in predicting tourists' PEBs, the following research hypotheses were posited based on the application of the revised TRA's framework in the nature tourism business context.

H1a: Size of business (SB) will be positively related to attitudes towards behaviors (AT).

H1b: Being an operator/family owned business (OFO) will be negatively related to attitudes towards behaviors (AT).

H2: Attitudes towards behaviors (AT) will be positively related to pro-environmental intentions (PEI).

H3: Subjective norms (SN) will be positively related to pro-environmental intentions (PEI).

H4: Perceived behavioral control (PBC) will be positively related to pro-environmental intentions (PEI).

H5: Perceived behavioral control (PBC) will be positively related to pro-environmental behaviors (PEB).

H6: Pro-environmental intentions (PEI) will be positively related to pro-environmental behaviors (PEB).

H7: When other variables are controlled in the prediction of pro-environmental behaviors (PEB), only pro-environmental intentions (PEI) and perceived behavioral control (PBC) have statistically significant regression coefficients.

H8: When other variables are controlled in the prediction of pro-environmental intentions (PEI), only attitudes towards behaviors (AT), subjective norms (SN), and perceived behavioral control (PBC) have statistically significant regression coefficients.

H9: When other variables are controlled in the prediction of attitudes towards behaviors (AT), only size of business (SB) and being an operator/family owned business (OFO) has statistically significant regression coefficients.

2.4.2 Norm-Activation Theory and Value-Belief-Norm Theory

Another group of explanations of PEB by pro-social motives (see Hines et al., 1986/87) was oriented from the *Norm-Activation Theory* (NAT) (Schwartz, 1973, 1977). NAT posits that moral or personal norms (PN) – self-expectations about behavior that are based on internalized values and anchored in the self – are direct determinants of pro-social behavior (e.g., PEB) when they are activated by a sequence of environmental

beliefs, including awareness of adverse consequences (AC) and ascription of responsibility to self (AR) (Schwartz, 1977). The burgeoning literature of PEB is characterized by an integrative model to combine the two aforementioned theoretical approaches (i.e., TRA and NAT) and enhance the proportion of the explained variance of PEI and/or PEB [see the summaries in Bamberg & Möser (2007) and Harland, Staats, & Wilke (1999)]. The fact that PEB is viewed as a mixture of self-interest and pro-social motives has justified the combined model and suggested its application in predicting PEI and/or PEB.

Expanding from the models of NAT (Schwartz, 1973, 1977) and TPB (Ajzen, 1985, 1991, 2009), Stern and colleagues proposed a theoretical model, *Value-Belief-Norm (VBN) Theory of Environmentalism* [see Figure 1 in Stern (2000), p. 412], following environmental surveys on self-reported pro-environmental behaviors and behavioral intentions that are determined by a causal chain of attitudinal factors, from environmental values, through three personal belief constructs (i.e., ecological worldviews, awareness of adverse consequences, ascription of responsibility), finally to personal norms (or sense of obligation to take PEBs) (Stern, Dietz, & Kalof, 1993; Stern, Kalof, Dietz, & Guagnano, 1995; Stern, Dietz, Abel, Guagnano, & Kalof, 1999; Stern, 2000). The model's causal chain of multiple mediation effects from general environmental beliefs to pro-environmental intentions have been successfully applied in a variety of environmental contexts to predict PEBs [see Klöckner (2013)'s meta-analysis of 56 selected studies of individual environmentally relevant behaviors by a pooled structural equation model]. However, it is rare to see the application of the VBN theory in the study of environmentally sustainable tourism (Juvan & Dolnicar, 2014), except a few recent

empirical studies (e.g., Han, 2015; López-Mosquera & Sánchez, 2012; van Riper & Kyle, 2014; Wynveen, Wynveen, & Sutton, 2015). In some of the PEB studies that adopted the VBN theory, empirically supported modifications and/or extension of the VBN model were integrated in the hypothesized models. For example, in the tourism management literature, a recent traveler survey in the green lodging industry merged VBN and TPB into a comprehensive path model to explain pro-environmental intentions (Han, 2015).

A three-prong conceptualization of environmental values is represented at the start of the causal chain, including biospheric (concerned about the biophysical environment), altruistic (focus on others), and egoistic (centered on one's self), to directly influence an individual's ecological worldview (Stern, Dietz, & Kalof, 1993; Stern & Dietz, 1994; Stern et al., 1995). An ecological worldview incorporates a set of general beliefs people hold about the nature and their relationships with the nature (Stern et al., 1995), which has been measured by the *New Ecological Paradigm* scale (NEP) (Dunlap & van Liere, 1978, 1984; Dunlap, van Liere, Mertig, & Jones, 2000) (see Table 2.4). Note that in Dunlap et al. (2000)'s revised NEP scale (see Table 1, p. 433), disagreement with the seven even-numbered items and agreement with the eight odd-numbered items imply pro-NEP perceptions.

The entire or partial fifteen items of the NEP scale have been widely tested by the tourism studies to investigate the environmental attitudes and behaviors of tourists (Han, 2015; Imran, Alam, & Beaumont, 2014; Jackson, 2007; Kim, Borges, & Chon, 2006; López-Mosquera & Sánchez, 2012; van Riper & Kyle, 2014; Wurzinger & Johansson, 2006; Wynveen, Wynveen, & Sutton, 2015). The empirical tourism studies along with other environmental behavioral studies have proved that NEP is a valid and reliable

construct in measuring an individual's ecological or environmental worldview (Dunlap, 2008).

To further the understanding of the complexities of PEBs, Stern (2000) concluded with three other groups of causal variables – contextual forces, personal capabilities, and habit or routine – and interactions of these four causal factors to explain behaviors with significant environmental impacts. This proposition also suggested empirical studies to examine each specific PEB and synthetic model to reflect non-attitudinal causes of PEBs. While this study is primarily focused on the attitudinal antecedents of PEB, tourism operators' personal values, beliefs, and norms in the nature tourism business context are proposed to validate the VBN theory and fill the research void on PEBs in nature tourism operations.

Similar to applying the improved TRA model to the explanation of nature tourism operators' PEBs, a same assumption was also held that no significant difference exists about the ecological worldviews between tourists and tourism operators (see the example from Imran et al., 2014). Given the study objects of nature tourism operators and their PEBs in the tourism business and activity operations, the following research hypotheses were formulated:

H10a: Biospheric value (BV) will be positively related to the ecological worldview (NEP).

H10b: Altruistic value (AV) will be positively related to the ecological worldview (NEP).

H10c: Egoistic value (EV) will be negatively related to the ecological worldview (NEP).

H11: Ecological worldview (NEP) will be positively related to awareness of adverse consequences (AC).

H12: Awareness of adverse consequences (AC) will be positively related to ascription of responsibility (AR).

H13: Ascription of responsibility (AR) will be positively related to personal norms to take pro-environmental behaviors (PN).

H14: Personal norms to take pro-environmental behaviors (PN) will be positively related to pro-environmental behaviors (PEB).

H15: When other variables are controlled in the prediction of pro-environmental behaviors (PEB), only personal norms to take pro-environmental intentions (PN) has statistically significant regression coefficient.

H16: When other variables are controlled in the prediction of personal norms to take pro-environmental behaviors (PN), only ascription of responsibility (AR) has statistically significant regression coefficient.

H17: When other variables are controlled in the prediction of ascription of responsibility (AR), only awareness of adverse consequences (AC) has statistically significant regression coefficient.

H18: When other variables are controlled in the prediction of awareness of adverse consequences (AC), only ecological worldview (NEP) has statistically significant regression coefficient.

H19: When other variables are controlled in the prediction of ecological worldview (NEP), only biospheric value (BV), altruistic value (AV), and egoistic value (EV) have statistically significant regression coefficient.

CHAPTER III

RESEARCH DESIGN AND METHODS

3.1 Survey Design

3.1.1 Sample Selection

Sample frame for the study was obtained from an earlier study conducted by Texas AgriLife Extension that inventoried nature tourism businesses in the entire State of Texas (Gao et al., 2011). From that initial inventory, approximately 9,578 nature tourism operator names were identified; 1,855 of them posted email addresses on their websites. The nature tourism operations were then categorized into hunting, fishing, agritourism, and adventure tourism businesses. For the purpose of the study, we defined these four categories in order to facilitate data collection based on their primary activities offered to the public. Hunting and fishing businesses offered guided trips and leases for said activities. Agritourism businesses offered activities that were agriculture-based, such as farm stays, feeding animals, and picking fruits and vegetables. Adventure tourism was the “catch all” category offering a host of outdoor activities, such as kayaking, hiking, or bird-watching.

The 1,855 nature tourism businesses on the contact list were verified on an individual basis. As the studied nature tourism businesses are predominantly smaller enterprises on the tourism market and represent a high failure rate (Getz & Carlsen, 2000), their contact information (i.e., email addresses for owners and/or businesses) was thoroughly reviewed online in the Spring semester of 2017 to ascertain each email address represented an open business by the time of the survey. Finally, 1,400 nature

tourism businesses active in operation were identified as the sample frame of the web-based survey research.

3.1.2 Survey Method

Following the procedures in Dillman, Smyth, and Christian (2014) the questionnaire was uploaded to [Qualtrics.com](https://www.qualtrics.com) with a multi-screen interface. The responses are automatically recorded by the website and presented in both data sets and graphs. The study used the email addresses of the 1,400 nature tourism businesses in Texas to distribute the self-administered questionnaires. The questionnaire combines standardized questions in Likert scales and open-ended answer questions and was expected to complete within about 10-15 minutes. Respondents received a formal invitation through email asking them if they want to participate in an Internet survey in the early Fall semester of 2017. In the invitation email, each respondent was given a link to the Qualtrics online questionnaire and an introduction of the proposed study for the participant to review. Three email reminders were sent one week, two weeks, and three weeks following the initial invitation sent in September and reminded non-respondents to take part in the survey. Unfortunately, at the same time of the web survey distribution, the catastrophic Hurricane Harvey clobbered the coastal area of Texas, and the resulting floods inundated the Houston metropolitan area and eastern Texas. Businesses in the hurricane-stricken area, including nature tourism businesses, were substantively disrupted and recovering slowly in the coming months, if not in a worst-case situation where permanent closure particularly happened to small-sized businesses. This resulted in a low response rate from the nature tourism operators identified in this survey. Therefore, from December 2017 to January 2018, multiple attempts were made in sending a greeting

email to non-respondents as well as those who partially filled the questionnaire, and reminding them to participate in the survey. Meanwhile, nature tourism related professional associations in Texas were reached out for assistance of survey distribution, including Texas Travel Industry Association, East Texas Tourism Association, Texas Ag Industries Association, Texas Wildlife Association, Texas Deer Association, Texas Dove Hunters Association, and Texas Small Business Association. However, none of the contacted organizations was able to help distributing the survey to affiliated members. Overall, 155 nature tourism business operators submitted their responses via Qualtrics.com with a response rate of 11.1% ($= 155 / 1,400 \times 100\%$), while only 89 of them were considered complete and retained as a final dataset for further analyses. Therefore, the valid response rate of the nature tourism business operator survey was 6.4% ($= 89 / 1,400 \times 100\%$).

3.2 Measures

3.2.1 Pro-environmental Behavior

In the *Nature Tourism Operator Survey* (see Appendix A2), there are eight survey items (defined as PEB₁, PEB₂, ..., PEB₈) representing the categorized pro-environmental behaviors (PEBs) which a nature tourism operator practiced over the previous 12 months in his/her working business. The PEBs are waste management, recycling and energy conservation, natural resource conservation, responsible purchasing, selecting low-impact transport, suggesting environmental friendly accommodation, environmental communication, and donating to environmental entities. Each of the PEB items is provided as a dichotomous variable (1 = yes, 0 = no). As the outcome at the end of the

two path models in Figure 2.1, an average PEB score is calculated from the summation of the eight reported PEBs that are performed by survey respondents over the past year.

3.2.2 Antecedents of Pro-environmental Behavior in the TRA Model

The variables in the section of the questionnaire, including pro-environmental intention, attitudes towards the behavior, subjective norms, and perceived behavioral control, are adopted from the TRA model to predict PEBs of nature tourism operators. Additionally, two business characteristics are chosen as attitudinal antecedents at the beginning of the causal chain of the TRA model.

Pro-environmental Intention (PEI). Following TPB instruments in leisure and outdoor recreation studies (Ajzen & Driver, 1991; Ajzen & Driver, 1992; Daigle, Hrubes, & Ajzen, 2002; Rossi & Armstrong, 1999), two five-point Likert scales (1 = not at all to 5 = very great extent) are used to elicit intentions (PEI) to engage in the PEBs. (1) “I plan to engage in PEBs in the next 12 months”; and (2) “I will try to engage in PEBs in the next 12 months”.

Attitudes towards the Behavior (AT). Considering a simplified belief-based measure of AT from the expectancy-value model (Ajzen, 1991), four items in five-point Likert scales are used to assess attitudes towards the proposed PEBs. (1) “I believe PEBs in nature tourism operations are” 1 = extremely bad to 5 = extremely good; (2) “I believe PEBs in nature tourism operations are” 1 = extremely undesirable to 5 = extremely desirable; (3) “I believe PEBs in nature tourism operations are” 1 = extremely harmful to 5 = extremely beneficial; and (4) “I believe PEBs in nature tourism operations are” 1 = extremely foolish to 5 = extremely wise.

Subjective Norms (SN). The research employs the survey instruments of SN from three empirical studies (Han, 2015; Rossi & Armstrong, 1999; Yoon et al., 2013) and comes up with two five-point Likert scales (1 = strongly disagree to 5 = strongly agree). (1) “Most people who are important to me think I should engage in PEBs to reduce the impact of nature tourism”; and (2) “Most people who are important to me approve my engaging in PEBs to reduce the impact of nature tourism”.

Perceived Behavioral Control (PBC). Two different types of items from relevant literature are selected to measure PBC in five-point Likert scales (Daigle et al., 2002; López-Mosquera & Sánchez, 2012; Yoon et al., 2013). (1) “For me to engage in PEBs is” 1 = extremely difficult to 5 = extremely easy; and (2) “I have enough money, time, and opportunities required to perform PEBs” 1 = strongly disagree to 5 = strongly agree.

Business Characteristics. Among the many business operation-wise variables, two representative factors are taken into account – size of business (Dewhurst & Thomas, 2003; McKercher, 1998; Thomas, Shaw, & Page, 2011; Weaver & Lawton, 2007) and whether being owned by owner or family (Getz & Carlsen, 2000; McKercher & Robbins, 1998). The former is measured by asking number of employees in ordinal categories of 1 = 1, 2 = 2-5, 3 = 6-30, 4 = 31-50, and 5 = 51 or more. A dyadic variable with 1 = yes and 0 = no is coded for whether the nature tourism business is owned by operator/family or not. Other business questions included in the survey measure the following sets of variables: primary activity/program of business, and annual visitation.

3.2.3 Antecedents of Pro-environmental Behavior in the VBN Model

The VBN model suggests a chain of antecedents of PEBs in the fashion of multi-item constructs: Values (biospheric, altruistic, and egoistic) → Beliefs [ecological worldviews (NEP), awareness of consequences (AC), and ascription of responsibility

(AR)] → Personal Norms (PN) → Behaviors (PEBs). All the predictive variables of behaviors are listed in the second half of the survey questionnaire to examine the general VBN features of Texas nature tourism operators affecting their performance of PEBs.

Personal Norms (PN). PN is measured as a three-item construct with a five-point Likert scale (1 = strongly disagree to 5 = strongly agree) (López-Mosquera & Sánchez, 2012; Wynveen et al., 2015). (1) “I feel personally obliged to reduce the environmental impact of nature tourism”; (2) “Regardless of what others do, I feel morally obliged to preserve the nature tourism environment”; and (3) “I feel guilty when I don’t preserve the nature tourism environment”.

Ascription of Responsibility (AR). In this study AR is restricted to the perceived responsibility of PEB involvement to self and two items are chosen in a five-point Likert scale to represent this latent construct (1 = strongly disagree to 5 = strongly agree) (Schwartz, 1977; van Riper & Kyle, 2014). (1) “I feel jointly responsible for the environmental impacts of nature tourism activities”; and (2) “I am not concerned about the environment for nature tourism” (reverse-coded).

Awareness of Consequences (AC). Three AC items rated as five-point Likert scales are adopted from tourism and hospitality literature in studying PEBs (1 = strongly disagree to 5 = strongly agree) (Han, 2015; López-Mosquera & Sánchez, 2012). (1) “Nature tourism activities cause environmental impacts (e.g., water pollution, exhaustion of natural resources) on the neighboring communities”; (2) “PEBs in nature tourism help to minimize the environmental degradations”; and (3) “Protection of the environment in which nature tourism is operated is beneficial for us all”.

Ecological Worldview. Ecological worldviews are measured using the NEP scale’s

fifteen items (Dunlap et al., 2000). However, as found in the recent tourism and recreation literature employing the NEP scales to examine PEBs and perceptions about the environment, NEP dimensionality has been modified and applied in the various context [4 items in Han (2015), 6 single-dimensional items in van Riper & Kyle (2014), 9 items in López-Mosquera & Sánchez (2012), 12 two-dimensional items in Wynveen et al. (2015), and three-dimensional 15 items in Imran et al. (2014)]. Survey respondents are asked to rate their agreement upon a five-point scale (1 = strongly disagree to 5 = strongly agree) for each of the fifteen scales in Table 2.4. Consistently with the design of the revised NEP scale (Dunlap et al., 2000), the seven even-numbered items are reverse-coded to be aligned with the eight odd-numbered items indicating pro-NEP responses.

Values. Three multi-item constructs represent the three value factors – biospheric, altruistic, and egoistic values – in the VBN model (Stern et al., 1999; Stern, 2000), which have been employed to empirical studies in a few tourism studies on PEBs (Han, 2015; López-Mosquera & Sánchez, 2012; van Riper & Kyle, 2014). For each of the environmental value questions, survey respondents are asked to rate the extent of importance ranging from 1 = not at all to 5 = very great extent. (1) Biospheric Values (BV; four-item): a world of beauty, respecting the earth/harmony with other species, preventing pollution/conserving natural resources, and protecting the environment/preserving nature; (2) Altruistic Values (AV; four-item): a world at peace, unity with nature/fitting into nature, equality/equal opportunity for all, and social justice/correcting injustice/care for others; and (3) Egoistic Values (EV, four-item): social power/control over others/dominance, influential/having an impact on people and events, wealth/material possessions/money, and authority/the right to lead or command.

3.3 Data Analyses

Data analyses for this study proceeded in three major stages. The first stage of data analysis estimated missing data in IBM® SPSS® Statistics, Version 24 followed by examining descriptive statistics. A missing completely at random (MCAR) test was conducted for all the studied variables at once prior to replacing missing data (Little, 1988; Howell, 2013). The purpose of filling missing data was primarily to retain the size of the survey dataset and maintain an acceptable statistical power of data analyses. The results of MCAR tests revealed that the entire data were at least missing at random ($\chi^2 = 1,947.73$, $d.f. = 2,175$, $p = 1.000$). Consequently, missing data were replaced using the expectation-maximization algorithm (Howell, 2013). Descriptive statistics were used to assess nature tourism operators' PEBs and the associated antecedents specified in the conceptual models (Figure 2.1), operator personal characteristics, and nature tourism business characteristics. Exploratory Factor Analysis was employed to test the construct validity of the multi-item constructs in the TRA and VBN models. Meanwhile, Internal Consistency Reliability (Nunnally & Bernstein, 1994) was tested for all the multi-item constructs in the two models.

The second stage of the data analysis, for each of the two conceptual models, Pearson correlations were generated among all independent variables and dependent variables in an inter-item matrix that highlights coefficients that are significant at the .05 and .01 levels. For the VBN model, three variable blocks were formed by grouping independent variables as Values (BV, AV, and EV), Beliefs (NEP, AC, and AR), and Norms (PN). The inter-item correlation matrices tested research hypotheses H1a through H6 and H10a through H14. It is beneficial to explore important relationships among the variables that may be consistent or inconsistent with previously reported research

findings in the existing literature.

Last, the third stage of the data analysis employed OLS regressions to examine the dependent variables in the two models. For the TRA model, research hypotheses H7 and H8 were tested to determine if PEI and PBC predict PEB, and if PEI can be further explained by AT, SN, and PBC. H9 was explored to test whether AT is predicted by SB and OFO. For the VBN model, research hypotheses H14 – H19 were examined through a series of bivariate and multivariate OLS regression models to seek statistically significant predictors of PEB and its antecedents in the path model of VBN. Finally, given a review of the results of the multiple OLS regressions captured from the TRA and VBN conceptual models in Figure 2.1, the two models were re-depicted by leaving only significant predictive paths in them. The values of adjusted R^2 for the regression models were compared to indicate a better predictive model from the two for the explanation of PEBs practiced by nature tourism operators. In addition, Steigler's z -test (Steiger, 1980) was conducted to statistically examine which of the two strictly non-nested models predicted PEB significantly better.

CHAPTER IV

RESULTS

4.1 Descriptive Statistics

4.1.1 Nature Tourism Operators and Businesses

Table 4.1 presents the descriptive statistics for the characteristics of nature tourism operators and businesses from the 89 responses to the Texas Nature Tourism Business Survey in Appendix 2. The following results highlight some of the descriptive statistics of the studied variables included in the two proposed path models (Figure 2.1). Missing values were found in all the studied variables, the percentages of which ranged from 13.48% to 47.19% (from a question asking the annual gross revenue in dollar amount that concerned business confidentiality, although an IRB-approved disclosure of this study was provided upfront in the survey invitation email indicating no individual-level data would be reported).

Nature Tourism Operator Personal Characteristics. The average age of operators was 59.23 and ranged from 30 to 78. Most respondents (65%) were male and 77 out of the 78 valid responses were Whites (only one respondent was self-identified as American Indian). On average the operators obtained a college degree (mean, $M = 4.01$; standard deviation, $SD = .84$). Among the 89 respondents, the average household annual income ($M = 4.36$, $SD = 1.74$) was between category 4 (\$60,001 - \$75,000) and category 5 (\$75,001 - \$90,000) and their household size varied from 1 to 8 persons ($M = 2.40$, $SD = 1.24$).

Nature Tourism Business Characteristics. Seventy-seven responses showed 81% of these nature tourism businesses being open year-around other than seasonal and 81%

Table 4.1 Descriptive statistics of nature tourism operators and businesses

Variable	N	Missing Value %	Mean	Standard Deviation	Maximum	Minimum
Operator Personal Characteristics						
Age	69	22.47	59.23	11.91	78	30
Male	71	20.22	.65	.48	1	0
White	77	19.10	n/a	n/a	4	1
Highest Level of Education	73	17.98	4.01	.84	5	1
Household Annual Income	59	33.71	4.36	1.74	6	1
Household Size	68	23.60	2.40	1.24	8	1
Business Characteristics						
Being Open Year-around	77	13.48	.81	.40	1	0
Operator/Family-Owned	77	13.48	.81	.40	1	0
Number of Employees	76	14.61	2.22	1.00	5	1
Number of Full-Time Employees	69	22.47	6.61	14.82	85	0
Number of Part-Time Employees	66	25.84	5.05	7.06	31	0
Number of Contractors as Needed	64	28.09	3.94	11.00	70	0
Number of Visitors Per Year	70	21.35	44439.07	298508.37	2500000	20
Annual Gross Revenue (\$)	47	47.19	431161.70	850647.29	4000000	100
Primary Focus of Nature Tourism*						
Adventure Tourism	73	17.98	.41	.50	1	0
Agritourism	73	17.98	.27	.45	1	0
Fishing	73	17.98	.21	.41	1	0
Hunting	73	17.98	.21	.41	1	0

Note: * multiple foci of nature tourism were reported by the surveyed operators, and thus the sum of the means (i.e., the percentages of each business focus) was greater than 1 (i.e., 100%).

owned by an operator or a family. The average business size regarding the number of employees was situated between category 2 (2 to 5 persons) and category 3 (6 to 30 persons) ($M = 2.22$, $SD = 1.00$). It was followed by three self-reported questions about the number of various types of employees. On average, each business had about 7 full-time employees ($M = 6.61$, $SD = 14.82$), 5 part-time employees ($M = 5.05$, $SD = 7.06$), and 4 contractors on a need basis ($M = 3.94$, $SD = 11.00$). The responses implied an extremely wide range of the number of visitors per year, from 20 to 2.5 million visitors. Accordingly, from the 47 responses to the question about annual gross revenue, a similar wide range was found from \$100 to \$4 million U.S. dollars per year for each business.

Primary Focus of Nature Tourism. Another question where multiple answers were allowed to select investigated the primary focus of the nature tourism business. Seventy-three responses indicated 41% businesses with a focus on adventure tourism, 27% on agritourism, 21% on fishing, and another 21% on hunting. One business reported its dual-foci in agritourism and hunting, while two operators managed fishing and hunting altogether. Two businesses operated three types of nature tourism activities (i.e., adventure tourism, fishing, and hunting).

4.1.2 Pro-environmental Behavior

Pro-environmental Behavior (PEB). In Table 4.2, practices of eight PEBs in the past year were reported by most of the survey participants (missing value percentages ranging from 2.25% to 14.61%) and displayed in a descending order by the mean value. The findings implied that six out of the eight PEBs were implemented by close to or over half of the nature tourism operators (i.e., mean value close to or greater than .50). More specifically, more than 75% nature tourism operators practiced four PEBs (natural resource conservation, $M = 87\%$; waste management, $M = 79\%$; recycling and energy conservation, $M = 79\%$; and responsible purchasing, $M = 77\%$). Two other PEBs were moderately implemented (between 45% and 65%) (environmental communication, $M = 62\%$; and suggesting environmental friendly accommodation, $M = 47\%$), while the last two PEBs were less practiced by the surveyed operators (slightly below 40%) (donating to environmental entities, $M = 39\%$; and selecting low-impact transport, $M = 38\%$).

Missing values in the PEB questions were automatically filled by employing the expectation-maximization method (Howell, 2013). The results of Little's MCAR tests

revealed that the PEB responses were at least missing at random ($\chi^2 = 26.60$, $d.f. = 64$, $p = 1.000$). As an outcome in the two path models in Figure 2.1, a composite PEB scale was created by summing up the scores of the eight self-reported PEBs and then computing an average score. The mean of the composite PEB scale was .65, indicating a moderately high percentage ($M = 65\%$, $SD = 25\%$) of the general employment of PEBs in the nature tourism business operations. The internal consistency reliability coefficient, Cronbach α , was .74 for this composite scale, which reached a conventionally acceptable level of reliability [$\alpha \geq .70$, see Schmitt (1996) for a discussion of conventionally levels of coefficient α]. Outliers in the dataset revealed three operators practiced all of the eight PEBs in the past year, whereas at the other end of the spectrum, two operators responding “No” to all these PEBs.

Table 4.2 Descriptive statistics of pro-environmental behavior (PEB)

Variable	N	Missing Value %	Mean	Std. Dev.	Max.	Min.
Pro-environmental Behavior (PEB)	89	n/a	.65	.25	1	0
Natural Resource Conservation	84	5.62	.87	.34	1	0
Waste Management	86	3.37	.79	.41	1	0
Recycling and Energy Conservation	87	2.25	.79	.41	1	0
Responsible Purchasing	81	8.99	.77	.43	1	0
Environmental Communication	78	12.36	.62	.49	1	0
Suggesting Environmental Friendly Accommodation	78	12.36	.47	.50	1	0
Donating to Environmental Entities	77	13.48	.39	.49	1	0
Selecting Low-impact Transport	76	14.61	.38	.49	1	0

The following results highlighted the descriptive statistics of the antecedents of PEB in the TRA and VBN theoretical models that were proposed in Figure 2.1. All the missing values were filled by the expectation-maximization method in SPSS, thus the number of observations in the dataset was 89 for all the studied variables.

4.1.3 Antecedents of Pro-environmental Behavior in the TRA Model

Table 4.3 presents the descriptive statistics for all the antecedents of PEB in the TRA model, i.e., Pro-environmental Intention (PEI), Attitudes towards the Behavior (AT), Subjective Norms (SN), and Perceived Behavioral Control (PBC). A factor analysis was conducted to test the construct validity for each of the four multi-item constructs. The results showed all these multi-item scales were represented by a one-factor solution (factor loadings all greater than .85) with relatively high to high levels of reliability (Cronbach α ranging from .75 to .95). To maintain comparability among the scales, the items in each scale were averaged rather than added so the resulting scales of PEI, AT, SN, and PBC all ranged 1–5.

Table 4.3 Descriptive statistics of PEB antecedents in the TRA model

Variable	Mean	Std. Dev.	Max.	Min.	Cronbach α
Pro-environmental Intention (PEI)	3.36	1.02	5	1	.95
I plan to engage in PEBs in the next 12 months.	3.33	1.04	5	1	
I will try to engage in PEBs in the next 12 months.	3.40	1.04	5	1	
Attitudes towards the Behavior (AT)	4.27	.72	5	2.25	.93
I believe PEBs in nature tourism operations are good.	4.20	.83	5	2	
I believe PEBs in nature tourism operations are desirable.	4.27	.81	5	1	
I believe PEBs in nature tourism operations are beneficial.	4.29	.78	5	2	
I believe PEBs in nature tourism operations are wise.	4.30	.75	5	2	
Subjective Norms (SN)	3.69	.87	5	1	.90
Most people who are important to me think I should engage in PEBs to reduce the impact of nature tourism.	3.58	.92	5	1	
Most people who are important to me approve my engaging in PEBs to reduce the impact of nature tourism.	3.80	.92	5	1	
Perceived Behavioral Control (PBC)	3.21	.94	5	1	.75
For me to engage in PEBs is easy.	3.39	1.03	5	1	
I have enough money, time, and opportunities required to perform PEBs.	3.02	1.08	5	1	

Averaging the two items representing the nature tourism operators' intentions (PEI) to engage in the aforementioned eight PEBs yielded a high-reliability scale (Cronbach α = .95) with $M = 3.36$ and $SD = 1.02$. Similarly, their attitudes (AT) towards the PEBs

asked by four five-point Likert scaled questions were averaged as another high-reliability scale (Cronbach $\alpha = .93$) with $M = 4.27$ and $SD = .72$. Two different questions of subjective norms (SN) that influenced the tourism operators' PEB adoption and implementation were averaged into a single scale (Cronbach $\alpha = .90$) with $M = 3.69$ and $SD = .87$. According to the TRA model, perceived behavioral control (PBC) of PEBs were evaluated by two interrelated questions that were averaged into a comprehensive scale (Cronbach $\alpha = .75$) with $M = 3.21$ and $SD = .94$.

4.1.4 Antecedents of Pro-environmental Behavior in the VBN Model

Seven constructs elicited from the VBN model, including three four-item Value constructs [Biospheric Value (BV), Altruistic Value (AV), and Egoistic Value (EV)], a fifteen-item construct of Ecological Worldviews (NEP), Awareness of Consequences (AC), Ascription of Responsibility (AR), and Personal Norms (PN), were examined for their construct validity by a series of exploratory factor analyses. Six of these constructs resulted in a one-factor solution (factor loadings all greater than .60) with moderate to high levels of reliability (Cronbach α ranging from .64 to .90) (see Table 4.4). The only exception was the NEP items from which three factors were extracted by using the Principal Component Analysis and the Varimax Rotation with Kaiser Normalization. Again, the items in the six original constructs from the VBN model and the items from the three extracted NEP factors were averaged into multi-item scales that ranged from 1 to 5.

Table 4.4 shows that three personal norm (PN) variables were averaged to generate a scale (Cronbach $\alpha = .84$) with $M = 4.03$ and $SD = .83$. The second question for ascription

of responsibility (AR) (“I am not concerned about the environment for nature tourism”) was recoded in consistence with the first AR question. An averaged scale of moderate reliability (Cronbach $\alpha = .64$) was computed with $M = 4.07$ and $SD = .79$. The awareness of consequences (AC) were rated by three questions which were combined and averaged into another scale (Cronbach $\alpha = .74$) with $M = 3.84$ and $SD = .81$.

Table 4.4 Descriptive statistics of PEB antecedents in the VBN model

Variable	Mean	Std. Dev.	Max.	Min.	Cronbach α
Personal Norms (PN)	4.03	.83	5	1	.84
I feel personally obliged to reduce the environmental impact of nature tourism.	4.06	.91	5	1	
Regardless of what others do, I feel morally obliged to preserve the nature tourism environment.	4.27	.77	5	1	
I feel guilty when I don't preserve the nature tourism environment.	3.75	1.15	5	1	
Ascription of Responsibility (AR)	4.07	.79	5	2.50	.64
I feel jointly responsible for the environmental impacts of nature tourism activities.	3.82	.92	5	1	
I am <u>not</u> concerned about the environment for nature tourism. *	4.33	.92	5	2	
Awareness of Consequences (AC)	3.84	.81	5	1	.74
Nature tourism activities cause environmental impacts on the neighboring communities.	3.27	1.23	5	1	
PEBs in nature tourism help to minimize the environmental degradations.	3.88	.92	5	1	
Protection of the environment in which nature tourism is operated is beneficial for us all.	4.38	.79	5	1	
Biospheric Values (BV)	4.24	.68	5	2	.90
A world of beauty.	4.18	.69	5	2	
Respecting the earth, harmony with other species.	4.19	.88	5	1	
Preventing pollution, conserving natural resources.	4.30	.80	5	1	
Protecting the environment, preserving nature.	4.29	.75	5	2	
Altruistic Values (AV)	4.00	.88	5	1	.88
A world at peace.	4.23	.90	5	1	
Unity with nature, fitting into nature.	4.16	.93	5	1	
Equality, equal opportunity for all.	3.90	1.06	5	1	
Social justice, correcting injustice, care for others.	3.70	1.18	5	1	
Egoistic Values (EV)	2.48	.72	4.50	1	.72
Social power, control over others, dominance.	1.97	1.06	5	1	
Influential, having an impact on people and events.	3.03	.89	5	1	
Wealth, material possessions, money.	2.42	.92	5	1	
Authority, the right to lead or command.	2.51	1.03	5	1	

Note: * denotes reverse-coded survey items.

Each of the three value constructs in the VBN model was compiled from four underlying items and averaged as a single scale with Cronbach α of .90 for biospheric value (BV), .88 for altruistic value (AV), and .72 for egoistic value (EV). The first two scales were high above the midpoint (3) of the 1-5 Likert scale (i.e., $M_{BV} = 4.24$, $SD_{BV} = .68$; $M_{AV} = 4.00$, $SD_{AV} = .68$). As to the other scale EV, three out of four questions were assessed negatively (i.e., mean values less than the midpoint of 3, ranging from 1.97 to 2.51). Thus, the averaged EV scale with $M = 2.48$ and $SD = .72$ was also below the midpoint of the 1-5 Likert scale, indicating a relatively negative perception from the nature tourism operators on this defined value in the VBN model.

In Table 4.5, ecological worldview measured by the NEP scale's fifteen items (Dunlap et al., 2000) was factor analyzed with a rotation method to better reveal the factors with an eigenvalue $\lambda > 1$. Note that the seven even-numbered items in Table 2.4 were recoded to align with the eight odd-numbered NEP items. The items loading on each of the three factors were averaged to yield three NEP factors explaining about 62% of the total variance. All factor loadings exceeded .40 (Hair, Anderson, Tatham, & Black, 1998). Factor NEP-1, labeled as Natural Resource Equilibrium (NRE) (Cronbach $\alpha = .85$, $M = 3.63$, and $SD = .79$), consisted of seven items (2, 7, 8, 9, 11, 12, & 13) which indicated views on the limited natural resources used in a balance by humans. Factor NEP-2, reflecting Human Activity Exploitation (HAE) (Cronbach $\alpha = .77$, $M = 3.17$, and $SD = .86$), contained four items (4, 6, 10, & 14) representing a negative meaning of human controlling over the nature. The last factor of NEP-3, namely Nature-Human Tension (NHT) (Cronbach $\alpha = .81$, $M = 3.39$, and $SD = .98$), covered the rest four items in the NEP scale (1, 3, 5, & 15) and exhibited the tension between humans and the nature.

Table 4.5 Descriptive statistics of ecological worldview (NEP) variables and factors

Variable	Factor**			Mean	Std. Dev.	Max.	Min.	Cronbach α
	NEP-1	NEP-2	NEP-3					
NEP-1: Natural Resource Equilibrium (NRE)				3.63	.79	5	1.43	.85
Humans have the right to modify the natural environment to suit their needs. *	.44	.43	.06	3.38	1.09	5	1	
Plants and animals have as much right as humans to exist.	.55	.24	.51	3.72	1.14	5	1	
The balance of nature is strong enough to cope with the impacts of modern industrial nations. *	.64	.42	.04	3.56	1.03	5	1	
Despite our special abilities humans are still subject to the laws of nature.	.80	-.03	.10	4.25	.89	5	1	
The earth is like a spaceship with very limited room and resources.	.61	.24	.42	3.43	1.21	5	1	
Humans were meant to rule over the rest of nature. *	.51	.47	.37	3.33	1.27	5	1	
The balance of nature is very delicate and easily upset.	.72	.03	.38	3.71	1.00	5	1	
NEP-2: Human Activity Exploitation (HAE)				3.17	.86	5	1.25	.77
Human ingenuity will insure that we do NOT make the earth unlivable. *	.15	.80	-.03	2.85	1.06	5	1	
The earth has plenty of natural resources if we just learn how to develop them. *	-.09	.73	.26	2.87	1.11	5	1	
The so-called “ecological crisis” facing humankind has been greatly exaggerated. *	.36	.62	.34	3.23	1.34	5	1	
Humans will eventually learn enough about how nature works to be able to control it. *	.16	.71	.05	3.71	.98	5	1	
NEP-3: Nature-Human Tension (NHT)				3.39	.98	5	1	.81
We are approaching the limit of the number of people the earth can support.	.37	.36	.66	3.39	1.25	5	1	
When humans interfere with nature it often produces disastrous consequences.	.01	-.17	.75	3.59	1.23	5	1	
Humans are severely abusing the environment.	.27	.29	.73	3.41	1.22	5	1	
If things continue on their present course, we will soon experience a major ecological catastrophe.	.49	.32	.65	3.19	1.20	5	1	

Note: * denotes reverse-coded survey items.

** denotes factors extracted by Principal Component Analysis and Varimax Rotation with Kaiser Normalization.

The redefinition of the NEP factors requires a corresponding revision of some hypotheses. Hypotheses 10a, 10b, 10c, 11, 18, and 19 substituted nature resource equilibrium (NRE), human activity exploitation (HAE), and nature-human tension (NHT) for ecological worldview (NEP). H19 was broken into three sub-hypotheses of H19a (predicting NRE), H19b (predicting HAE), and H19c (predicting NHT).

4.2 Correlation Analyses

4.2.1 Interrelationships among Variables in the TRA Model

Table 4.6 presented the inter-item correlations among all variables, both dependent (7 - PEB) and independent variables (1- SB, 2 - OFO, 3 - AT, 4 - SN, 5 - PBC, and 6 - PEI) discussed in the TRA model (Figure 2.1).

Table 4.6 Inter-item correlations among TRA variables

Variable	SB	OFO	AT	SN	PBC	PEI
1 SB						
2 OFO	-.28**					
3 AT	.14	-.02				
4 SN	.18*	-.31**	.52**			
5 PBC	.08	-.17	.37**	.54**		
6 PEI	.15	-.31**	.54**	.70**	.51**	
7 PEB	.12	-.08	.10	.40**	.32**	.50**

Notes: $N = 89$; * $p < .05$ level; ** $p < .01$; all significance tests are one-tailed because the available research indicated the direction of effect for the independent variables.

Contrary to research hypotheses H1a [size of business will be positively related to attitudes towards behaviors (AT)] and H1b (being a family/operator owned business will be negatively related to AT), AT was not significantly correlated with either size of business or being a family/operator owned business. H2 [AT will be positively related to pro-environmental intentions (PEI)], H3 [subjective norms (SN) will be positively related to PEI], and H4 [perceived behavioral control (PBC) will be positively related to PEI] were supported by statistically significant correlations of PEI with AT ($r = .54$), SN ($r =$

.70), and PBC ($r = .51$) at $p < .01$. As predicted by H5 [PBC will be positively related to pro-environmental behaviors (PEB)] and H6 (PEI will be positively related to PEB), PEB was significantly correlated with PBC ($r = .32$) and PEI ($r = .50$) at $p < .01$.

4.2.2 Interrelationships among Variables in the VBN Model

All the factors and variables derived from the VBN model were entered into a series of bivariate correlational analyses as shown in Table 4.7. Dependent variables and independent variables were listed by variable blocks. Variables 1-3 were three factors of values; variables 4-8 included five factors of beliefs; variable 9 was norms; and variable 10 represented PEB.

Table 4.7 Inter-item correlations among VBN variables

Variable	BV	AV	EV	NRE	HAE	NHT	AC	AR	PN
1 BV									
2 AV	.84**								
3 EV	.01	.11							
4 NRE	.68**	.69**	-.01						
5 HAE	.39**	.46**	-.10	.56**					
6 NHT	.51**	.53**	-.18*	.69**	.48**				
7 AC	.52**	.51**	.08	.45**	.26**	.54**			
8 AR	.54**	.48**	-.04	.47**	.28**	.54**	.52**		
9 PN	.63**	.67**	.09	.61**	.35**	.62**	.57**	.67**	
10 PEB	.14	.12	-.02	.10	-.05	.40**	.43**	.25**	.34**

Notes: $N = 89$; * $p < .05$ level; ** $p < .01$; all significance tests are one-tailed because the available research indicated the direction of effect for the independent variables.

Research hypothesis H10a [biospheric value (BV) will be positively related to the ecological worldview (NEP)] was strongly supported by the three statistically significant correlations of NRE ($r = .68$), HAE ($r = .39$), and NHT ($r = .51$) with BV at $p < .01$. H10b [altruistic value (AV) will be positively related to NEP] was also supported by the significant relationships between AV and NRE ($r = .69$), HAE ($r = .46$), and NHT ($r = .53$) at $p < .01$. Nonetheless, the last hypothesis testing correlations between values and worldviews, H10c [egoistic value (EV) will be negatively related to NEP] was only

partially supported by correlation of NHT with EV ($r = -.18$) at $p < .05$.

H11 [NEP will be positively related to awareness of adverse consequences (AC)] was supported by significant correlations of NRE ($r = .45$), HAE ($r = .26$), and NHT ($r = .54$) with AC at $p < .01$. H12 [AC will be positively related to ascription of responsibility (AR)] was also supported by a significant positive correlation between AC and AR ($r = .52$) at $p < .01$. Furthermore, H13 [AR will be positively related to personal norms to take pro-environmental behaviors (PN)] and H14 (PN will be positively related to PEB) were both supported by significant positive correlations of AR with PN ($r = .67$) and PN with PEB ($r = .34$) at $p < .01$.

4.3 OLS Regression Analyses

Following the examinations of the bivariate relationships between the independent variables and dependent variable (PEB), OLS regressions were utilized to build predicative models for hypothesis testing and exploration purposes.

4.3.1 OLS Regressions in the TRA Model

To test research hypotheses H7, H8, and H9, three multivariate OLS regressions were examined to regress the dependent variables (PEB, PEI, and AT, respectively) on the independent variables. The OLS regression models were as follows.

$$PEB = b_0 + b_1 \cdot PEI + b_2 \cdot PBC + e \quad (H7)$$

$$PEI = b_0 + b_1 \cdot AT + b_2 \cdot SN + b_3 \cdot PBC + e \quad (H8)$$

$$AT = b_0 + b_1 \cdot SB + b_2 \cdot OFO + e \quad (H9)$$

H7 (predicting PEB) was partially supported by Table 4.8 Model 1, which indicates PEI had a significant regression coefficient ($b = .12$, $\beta = .46$) at $p < .001$ but surprisingly

PBC did not. H8 (predicting PEI) was also partially supported by Model 2, which shows two significant coefficients, AT ($b = .30, \beta = .21$) at $p < .05$ and SN ($b = .59, \beta = .50$) at $p < .001$, while PBC did not have a significant coefficient at $p < .05$. Consistent with the correlational analyses, H9 (predicting AT) was not supported, because the global F -test for the validity of the regression model was not statistically significant.

Table 4.8 OLS regressions in the TRA model

Dependent Variables	PEB (Model 1)		PEI (Model 2)	
Independent Variables	b	β	b	β
AT	-	-	.30*	.21
SN	-	-	.59**	.50
PBC	.02	.09	.17	.16
PEI	.12**	.46	-	-
Constant	.19	-	-.63	-
R^2		.26		.55
Adjusted R^2		.24		.53

Notes: $N = 89$; * $p < .05$; ** $p < .001$.

4.3.2 OLS Regressions in the VBN Model

In accordance with the flow in the VBN path model (Figure 2.1), a series of bivariate OLS regression model were first tested (see Models 3, 4, and 5 in Table 4.9). Research hypothesis H15 (predicting PEB) was supported by Model 3 in that PN had a significant coefficient ($b = .09, \beta = .31$) at $p < .01$. H16 (predicting PN) was supported by Model 4 where AR had a significant coefficient ($b = .71, \beta = .67$) at $p < .001$. Likewise, H17 (predicting AR) was supported by Model 5 in that AC had a significant coefficient ($b = .51, \beta = .52$) at $p < .001$.

$$\text{PEB} = b_0 + b_1 \cdot \text{PN} + e \quad (\text{H15})$$

$$\text{PN} = b_0 + b_1 \cdot \text{AR} + e \quad (\text{H16})$$

$$\text{AR} = b_0 + b_1 \cdot \text{AC} + e \quad (\text{H17})$$

Next, in Table 4.9, the results of four multivariate OLS regressions models were displayed to test the paths between AC and NEP factors (H18), and between Value factors and NEP factors (H19a, H19b, and H19c). Model 6 partially supported research hypothesis H18 (predicting AC) in that only NHT had a statistically significant coefficient ($b = .38, \beta = .46$) at $p < .001$ but neither NRE nor HAE had a significant regression coefficient at $p < .05$. H19 (predicting NEPs) was partially supported by Models 7-9. AV had a significant coefficient consistently across the three NEP factors ($b_{AV \rightarrow NRE} = .40, \beta_{AV \rightarrow NRE} = .45$ at $p < .01$; $b_{AV \rightarrow HAE} = .52, \beta_{AV \rightarrow HAE} = .53$ at $p < .01$; and $b_{AV \rightarrow NHT} = .45, \beta_{AV \rightarrow NHT} = .40$ at $p < .05$), whereas only two other significant coefficients were found in BV predicting NRE ($b_{BV \rightarrow NRE} = .35, \beta_{BV \rightarrow NRE} = .30$) at $p < .05$ and EV predicting NHT ($b_{EV \rightarrow NHT} = -.30, \beta_{EV \rightarrow NHT} = -.22$) at $p < .05$.

$$AC = b_0 + b_1 \cdot NRE + b_2 \cdot HAE + b_3 \cdot NHT + e \quad (\text{H18})$$

$$NRE = b_0 + b_1 \cdot BV + b_2 \cdot AV + b_3 \cdot EV + e \quad (\text{H19a})$$

$$HAE = b_0 + b_1 \cdot BV + b_2 \cdot AV + b_3 \cdot EV + e \quad (\text{H19b})$$

$$NHT = b_0 + b_1 \cdot BV + b_2 \cdot AV + b_3 \cdot EV + e \quad (\text{H19c})$$

The OLS regression results were summarized in Figure 4.1, which shows the two predicted paths affecting PEB. In the first path derived from the TRA model, the effects of the antecedent variables (i.e., AT and SN) on PEB were mediated by PEI. In the second path originated from the VBN model, the effects of the primary antecedent variables (AV and EV) on PEB were mediated by a chain of Beliefs variables (i.e., NHT, AC, and AR) and a Norms variable (i.e., PN). Note that some of the regression coefficients in the two conceptual models were nonsignificant and thus depicted in dash lines as unpredicted effects.

4.3.3 A Comparison of the TRA and VBN Models

Regarding testing the TRA model in the context of nature tourism operators' pro-environmental intentions (PEI) and behaviors (PEB), the two OLS regression models resulted in R^2 values of .55 (PEI) and .26 (PEB), which indicated 55% of the total variance of PEI and 26% of the total variance of PEB was explained by Model 2 and Model 1, respectively.

Regarding the hypotheses testing for the paths in the VBN model, the total variance of nature tourism operators' pro-environmental behaviors (PEB) was merely 10% explained by Model 3 [$R^2 = .10$, Personal Norms (PN) predicting PEB], whereas the rest of the path model was moderately corroborated between the Beliefs antecedents. In particular, Models 4 to 6 rendered R^2 of .45 [Ascription of Responsibility (AR) predicting PN], .27 [Awareness of Consequences (AC) predicting AR], and .31 [Ecological Worldview (NEP) predicting AC]. The three factors representing Values [i.e., Biospheric Values (BV), Altruistic Values (AV), and Egoistic Values (EV)] also had moderate predictive effects on the three NEP factors, namely Natural Resource Equilibrium (NRE; $R^2 = .52$), Human Activity Exploitation (HAE; $R^2 = .24$), and Nature-Human Tension (NHT; $R^2 = .34$).

The two regression models predicting PEB (i.e., Model 1 vs. Model 3) are strictly non-nested models since there are no overlapping predictors from the regression formulas. To compare for explanatory power across them, the Adjusted R^2 value of each model was first reviewed as it takes into account the number of independent variables in the model (i.e., two independent variables in Model 1 and only one independent variable in Model 3) whereas the regular R^2 does not. The findings indicated that Model 1 based

on TRA had better explanatory power (Adjusted $R^2 = .24$) than Model 3 based on VBN (Adjusted $R^2 = .09$).

In addition, Steigler's z -test (Steiger, 1980) was conducted to statistically examine which of the two models predicted PEB significantly better. First, an unstandardized predicted value of PEB (the dependent variable) was computed from each of the two models. Second, a bivariate correlation matrix was showcased to test the relationship between the actual PEB variable and each of the two predicted PEBs (Table 4.10). For Steigler's z -test, the R in each regression model (i.e., Model 1 and Model 3) was computed from this correlation matrix, i.e., $R_{\text{PRE-TRA}} = .51$ (note that $R^2_{\text{Model 1}} = .26$) and $R_{\text{PRE-VBN}} = .31$ (note that $R^2_{\text{Model 3}} = .10$) both significant at $p < .01$. Although the two models based on two different behavioral theories are strictly non-nested models in nature, they were correlated with each other ($R_{\text{PRE-TRA} \cdot \text{PRE-VBN}} = .55$) significantly at $p < .01$. Third, using a computer software online (Lee and Preacher, 2013), each correlation coefficient (i.e., R) was converted into a z -score using Fisher's r -to- z transformation followed by Steiger's z -test ($z = 2.22$). Last, the z -score ($= 2.22$) was compared to a critical value at $p < .05$ ($|z| > 1.96$), indicating that Model 1 and Model 3 predicted PEB significantly different at $p < .05$. The Steigler's z -test confirmed that the OLS regression model derived from the TRA theory (Model 1) predicted PEB better than the one derived from the VBN theory (Model 3), given the nature tourism operator's survey dataset ($N = 89$).

Table 4.9 OLS regressions in the VBN model

Dependent Variables	PEB (Model 3)		PN (Model 4)		AR (Model 5)		AC (Model 6)		NRE (Model 7)		HAE (Model 8)		NHT (Model 9)	
	<i>b</i>	β	<i>b</i>	β	<i>b</i>	β	<i>b</i>	β	<i>b</i>	β	<i>b</i>	β	<i>b</i>	β
BV	-	-	-	-	-	-	-	-	.35*	.30	-.08	-.06	.26	.18
AV	-	-	-	-	-	-	-	-	.40**	.45	.52**	.53	.45*	.40
EV	-	-	-	-	-	-	-	-	-.07	-.06	-.19	-.15	-.30*	-.22
NRE	-	-	-	-	-	-	.16	.16	-	-	-	-	-	-
HAE	-	-	-	-	-	-	-.05	-.05	-	-	-	-	-	-
NHT	-	-	-	-	-	-	.38***	.46	-	-	-	-	-	-
AC	-	-	-	-	.51***	.52	-	-	-	-	-	-	-	-
AR	-	-	.71***	.67	-	-	-	-	-	-	-	-	-	-
PN	.09**	.31	-	-	-	-	-	-	-	-	-	-	-	-
Constant	.27*	-	1.15**	-	2.13***	-	2.13***	-	.69	-	1.85**	-	1.27*	-
<i>R</i> ²	.10		.45		.27		.31		.52		.24		.34	
Adjusted <i>R</i> ²	.09		.44		.26		.28		.50		.21		.32	

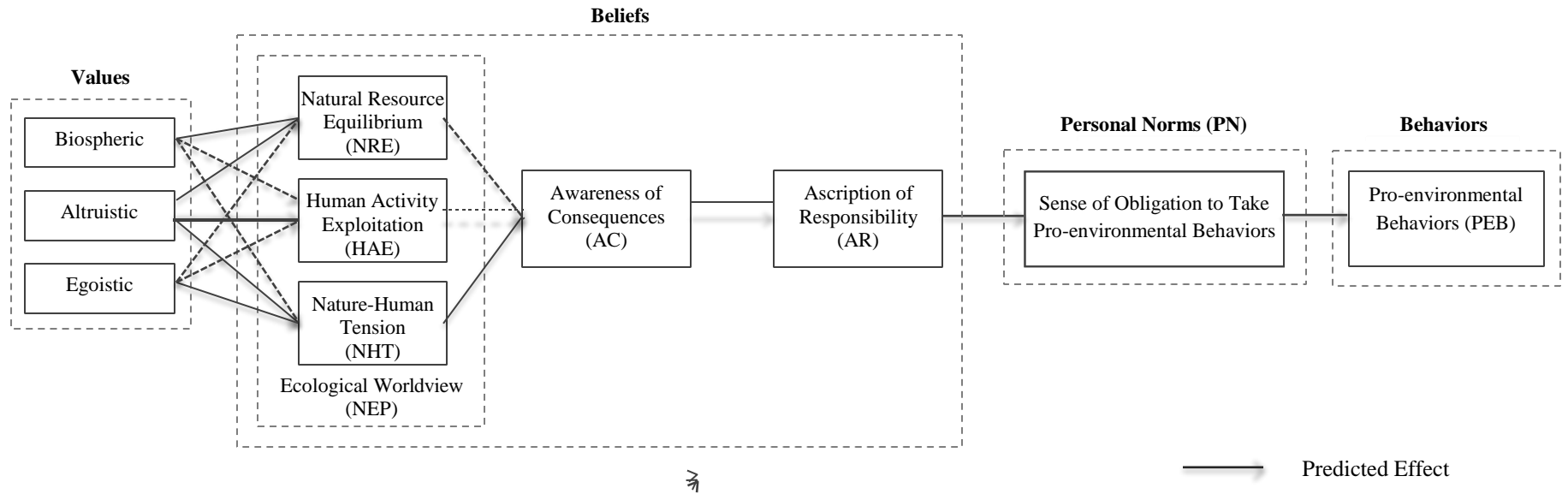
Notes: *N* = 89; * *p* < .05; ** *p* < .01; *** *p* < .001.

Table 4.10 Correlations between actual PEB and predicted PEB variables

Variable	Actual PEB	Predicted PEB (TRA)
Actual PEB		
Predicted PEB (TRA)	.51**	
Predicted PEB (VBN)	.31**	.55**

Notes: *N* = 89; ** *p* < .01 (two-tailed t-test).

VBN Model



————— Predicted Effect
 - - - - - Unpredicted Effect

TRA Model

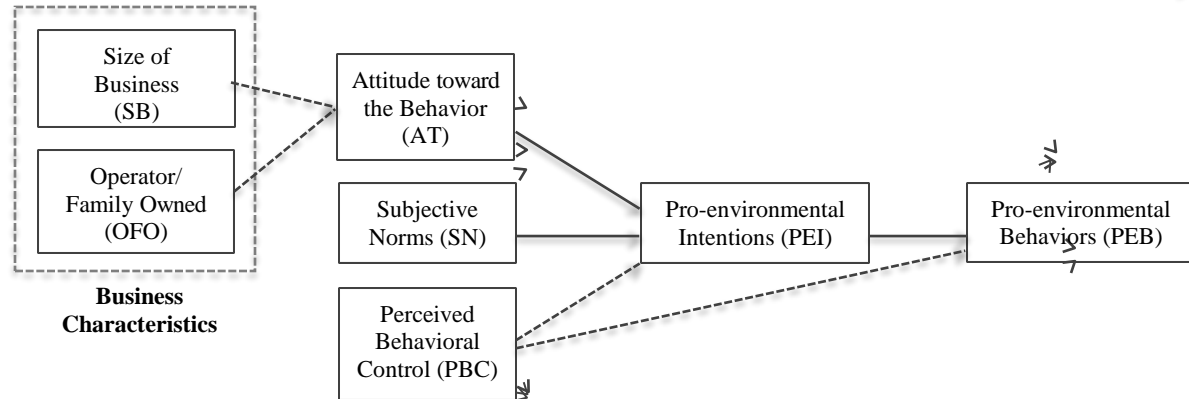


Figure 4.1 Revised models using TRA and VBN theories

CHAPTER V

DISCUSSIONS AND CONCLUSIONS

5.1 Theoretical Contributions: An Examination of Research Hypotheses

This study appears to be the first to systematically examine *tourism operators' pro-environmental behaviors (PEBs)* and the correspondent *antecedents*. It utilized first-hand data collected from a self-reported web survey with Texas nature tourism business operators in the market segments of fishing, hunting, adventure tourism, and agritourism. In this survey research, the eight classified PEBs of nature tourism operators, including waste management, recycling and energy conservation, natural resource conservation, responsible purchasing, selecting low-impact transport, suggesting environmental friendly accommodation, environmental communication, and donating to environmental entities, were selected from the existing nature tourism literature and indicated similar environmental orientations and interests between tour operators and tourists.

It was found from the literature review (i.e., Chapter II) that the majority of the extant explanatory nature tourism research is focused on *tourists* and/or *local residents* regarding their attitudes, behaviors, and decision making relevant to environmental protection and sustainable tourism development [see the findings from Ardoin, Wheaton, Bowers, Hunt, & Durham, 2015). However, from Imran et al. (2014)'s comparative study about environmental orientations and environmentally responsible behaviors among four stakeholder groups, the results implied no significant differences were found between tourists and tourism enterprises (tour operators and hotel owners) about their attitudes towards the New Ecological Paradigm (NEP) scale (which was adopted in this study to represent Worldviews in the *Value-Belief-Norm* theoretical model). Iyer (1999) suggested

that a good environmental management record of businesses makes sound economic sense because a pro-environmental business recruits better employees and attracts more customers, and thus increases long-term profits. Additionally, Sirakaya and McLellan (1998) explained that ecotourism businesses might comply with ecotourism guidelines if through their daily operations they come to believe potential long-term economic benefits can be gained from compliance with the pro-environmental ecotourism managerial practices. Last but not least, Moskwa (2010)'s study on landholders' conservation perspectives through ecotourism also echoes that conservation and environmental goals motivate their economic pursuit of ecotourism activities and reduce the financial reliance on pastoralism.

Given the support from Imran et al. (2014), Iyer (1999), Sirakaya and McLellan (1998), and Moskwa (2010), this study chose eight typical PEBs of tourism operators from a review of the current literature and applied the findings of explanatory *tourists' PEBs* research to studying *tourism operators' PEBs and antecedents*. Although two PEBs were found from the web survey to be less practiced (donating to environmental entities and selecting low-impact transport), the other six PEBs were well accepted and implemented by the nature tourism operators in Texas (their means were all close to or above .50 in the dummy-coded PEB questions). The averaged index of an overall representation of the eight PEBs showed a relatively high reliability (Cronbach $\alpha = .74$) and was used in the inferential models to find significant predictive variables.

Furthermore, in the fairly limited nature tourism operator studies, most of them tends to profile nature tourism businesses and operators as background information or in a descriptive fashion (e.g., Carey & Gountas, 1997; Weiler & Davis, 1993; Weiler, 1993).

In response to the call for researching nature tour operators and “objectives, techniques, and implementation of ecotourism operations” (Higgins, 1996: 16), the study became one of the trailblazers quantitatively testing nature tourism operators’ PEBs and seeking explanations of these operational behaviors. It applied a theory-testing approach to the behavioral data of nature tourism operators, rather than an exploratory investigation, and thus contributes to the pro-environmental behavior studies and the nature tourism and outdoor recreation literature by filling the research void of studying PEBs of tourism operators.

The explanatory analyses of nature tourism operators’ PEBs were conducted by corroborating two well-established behavioral models – *Theory of Reasoned Action* (TRA; sometimes referred to as *Theory of Planned Behavior*, TPB) (Fishbein & Ajzen, 2010) and *Value-Belief-Norm Theory of Environmentalism* (VBN) (Stern, 2000). The findings of the study are supportive of the general findings in the broader environmental behavior studies as well as tourism and hospitality research associated with both theoretical models, because most of the directional paths in each model were validated through the correlation and regression analyses (see the solid arrowed lines depicted in Figure 4.1). Note, again, that the discussion of inferential statistics had to rely on all the existing nature tourism literature since tourism operator studies, in particular using a hypothesis-testing technique, are very limited up to date.

Given the review of the correlation and regression analyses in the TRA model, the dataset derived from the *Texas Nature Tourism Business Survey* (see Appendix 2) completely supported Hypotheses 2, 3, 4, 5, and 6; partially supported Hypotheses 7 and 8; and disconfirmed Hypotheses 1a, 1b, and 9. The complete supportive results of the

correlation analyses for Hypotheses 2-6 are unsurprisingly consistent with findings from an Alabama resident survey about hunting intentions (Rossi & Armstrong, 1999), a college student survey of five recreational activities (i.e., beach, jogging, mountain climbing, boating, and biking) (Ajzen & Driver, 1991; Ajzen & Driver, 1992), and an adventure tourism guide survey in the Himalayan area about three environmentally significant behaviors (Serenari et al., 2012), where attitudes toward behaviors (AT), subjective norms (SN), and perceived behavioral control (PBC) are all positively correlated with intention and/or actual behaviors.

The partial support obtained from testing Hypotheses 7 and 8 revealed two important findings. PBC was a non-significant predictor of nature tourism operators' pro-environmental intention (PEI) when other variables were controlled, which was consistent with the result from a phone interview study of Australian residents about constraints on climate change-friendly behavior (Yoon et al., 2013), but contrary to other studies that illustrated PBC's significant prediction of behavioral intention otherwise (Ajzen & Driver, 1992; Han, 2015; Han & Kim, 2010; López-Mosquera & Sánchez, 2012; Rossi & Armstrong, 1999). Comparatively, the two significant predictors of PEI – attitudes towards behavior (AT) and social norms (SN) tend to play a bigger role in motivating PEI for tourism operators. Another finding is that PBC did not significantly predict PEB, while PEI did when other variables were controlled. Two studies testing a series of regressions of PEB on PEI and PBC were compared with this research. Ajzen and Driver (1992) in fact reported inconsistent predictive effect across the five recreational activities (i.e., PBC or PEI was a significant regressor of participation in some of the five activities but not the others). Lin et al. (2018) found AT, SN, and PBC

were all significant predictors of tour operators' three types of practices regarding corporate social environmental responsibility. One needs to be very cautious when comparing the regression of behavior on PBC between the two studies as the studied subjects (tourism operators vs. recreationists) and types of behaviors (pro-environmental behaviors in operation vs. recreational activities) are both quite different from each other. Reflecting on the two questions items representing PBC in the operator survey – ease of engaging in PEBs and agreement of having enough money, time, and opportunities required to perform PEBs, one can conclude from the survey data that whether easy or difficult to engage in PEB and whether one secures the sufficient resources do not impact tourism operators' decision to implement PEBs in their business operation.

The disconfirmation of Hypotheses 1a, 1b, and 9 about exploring AT's explanatory variables [size of business (SB) and whether being an operator/family owned business (OFO)] was surprising, because the tourism literature informs that characteristics of small tourism businesses [whether being owned by owner or family (Dewhurst & Thomas, 2003; McKercher, 1998; Thomas et al., 2011; Weaver & Lawton, 2007; Getz & Carlsen, 2000; McKercher & Robbins, 1998)] can influence the decision making and management. The proposed hypotheses did not test the relationship between the two business characteristic variables and the concepts in the TRA/TPB model. However, significant correlations were found between SB and SN ($r = .18$) at $p < .05$, between OFO and SN ($r = -.31$) and between OFO and PEI ($r = -.31$) at $p < .01$ (see Table 4.6). Future research is recommended to include an examination of the predictive effects from basic business characteristics on attitudinal and behavioral variables in the TRA model. In addition, more features of tourism businesses are to be considered in a business operator

survey (e.g., how many years a tourism business has been in operation) since the additional business features may shed light on investigating managerial issues, such as PEBs.

A relevant note to make for predicting AT is that having primary external variables in the TRA model is in accordance with the addition of “Background Factors” in the revised TRA model (Fishbein & Ajzen, 2010) (see Figure 2.4). Reviewing past studies that had refined and extended the TPA and TPB models, Han and Kim (2010) asserted modifying paths and adding new constructs led to a better understanding of human behaviors in the contexts that served these different studies. Additional background factors and/or attitudinal variables added to the TRA or TPB models had indeed improved the statistical power (e.g., R^2) of explaining the variation of tourist or visitor intentions and behaviors (e.g., Han & Kim, 2010; Hsu & Huang, 2012; Yoon et al., 2013).

Given the review of the correlation and regression analyses in the VBN model, the nature tourism operator survey data completely supported Hypotheses 10a, 10b, 11, 12, 13, 14, 15, 16, and 17; and partially supported Hypotheses 10c, 18, and 19. The complete supportive results of the correlation analyses for Hypotheses 11-14 (NEP positively related to AC; AC positively related to AR; AR positively related to PN; and PN positively related to PEB) and regression analyses of Hypotheses 15-17 (everything else being equal, PN predicting PEB; AR predicting PN; and AC predicting AR) are unsurprisingly consistent with findings from an Australian residents phone survey of intentions to adopt PEB in the Great Reef Marine Park area (Wynveen et al., 2015), an onsite visitor survey of environmentally friendly actions at the U.S. Channel Islands

National Park (van Riper & Kyle, 2014), an online traveler survey of PEBs in a green lodging context (Han, 2015), and a local park visitor face-to-face survey of willingness to pay for a suburban park in Spain (López-Mosquera & Sánchez, 2012).

The complete support of H10a (BV positively related to NEP) and H10b (AV positively related to NEP) is consistent with three VBN studies (Han, 2015; López-Mosquera & Sánchez, 2012; van Riper & Kyle, 2014). The partial support of H10c (EV negatively related to NEP) also echoes the findings from two studies (López-Mosquera & Sánchez, 2012; van Riper & Kyle, 2014) which all show inconstant prediction of egoistic value (EV) on ecological worldview (NEP). The consistent results imply that no matter being a tourist/visitor or a tourism operator ecological worldviews can be predicted by biospheric value (BV) and altruistic value (AV) but not constantly predicted by egoistic value (EV).

Looking at the last two hypotheses derived from the VBN model, the partial support of H18 (others being equal, NEP predicts AC) noted only one of the three NEP factors (i.e., Nature-Human Tension, NHT) positively affected AC. Another partially supported hypothesis H19 (others being equal, BV, AV, and EV predict NEP) revealed AV's positive effect on all the three NEP factors (i.e., NRE, HAE, and NHT) while BV only positively affected NRE and EV only negatively predicted NHT. Three comparable studies from the literature review used different NEP items in their measurements and one NEP scale was used in the path analyses (Han, 2015; López-Mosquera & Sánchez, 2012; van Riper & Kyle, 2014). These three studies unanimously validated the predictive effects of NEP on AC, BV on NEP, and AV on NEP. Nonetheless, EV was not a

significant predictor of NEP. In sum, H18 and H19 share moderate consistency with these studies on PEB or PEI.

As the first exploration of its kind, the nature operator survey applied two well-established theoretical models (TRA and VBN) to a same survey study. These two behavioral models have been widely adopted by a variety of disciplines that study human behaviors and environmental conservation. One goal of this research was to seek a better behavioral model that could unfold the myth of how and why nature tourism operators comply with environmental sustainable guidance in operating their recreational facilities and activities.

By methodologically comparing the utility of the predictive power between the two models, TRA was suggested as the better predictive model for future research to test the TRA model in the context of tourism operations. The comparison was built upon the only single study of using both TRA and VBN to explain visitors' willingness to pay (WTP) to a suburban park in a natural setting (López-Mosquera & Sánchez, 2012), which solely relied on a straightforward comparison of the Adjusted R^2 coefficients of the two regressions on WTP.

There are two possible reasons for TRA performing better with the operator survey. One, compared to VBN, TRA appears a simpler model in terms of the number of constructs and causal relationships proposed in the model. In Figure 4.1, the revised TRA model in this study only included 5 multi-item constructs (i.e., PEB, PEI, AT, SN, and PBC), 2 single-item constructs (i.e., SB and OFO), and 7 causal relationships (i.e., the number of one-directional arrows placed between two constructs). However, the VBN model in Figure 4.1 presented 10 multi-item constructs (i.e., PEB, PN, AR, AC, NRE,

HAE, NHT, BV, AV, and EV) and 15 causal relationships. Parsimony seems a plausible reason in the theoretical representation of a causal chain that ultimately explains PEB. Two, a related methodological reason for TRA superior over VBN could be found when one responded to the web survey questionnaire. Since fewer questions were designed in the TRA section (see the Appendix, Blocks 2-5 of 10 questions displayed on 4 screens of the web interface), the respondent might be thinking about these issues more carefully. However, the survey questions in the VBN section (Blocks 6-10 of 35 questions displayed on 6 text-intensive screens) were more than three times of those of TRA and shown in the later part of the estimated 15-minute long survey. The respondent might be less patient and serious in choosing a best answer for each question in the latter sections. Future research is recommended to split the distributed long survey in multiple versions (e.g., two versions for this dissertation study, TRA followed by VBN and VBN followed by TRA) to improve the accuracy and completeness of survey responses.

Furthermore, an advanced comparative approach to hypothesis testing the significant difference between the two strictly non-nested models [i.e., Steigler's z -test (Steigler, 1980)] was employed, the result of which has reinforced the superiority of TRA from a more sophisticated statistical perspective. This sheds light on future tourism behavioral studies exploring alternative conceptual frameworks for a less studied stakeholder group and validating a superior model.

5.2 Practical Implications for Nature Tourism Practitioners and Policy Makers

In addition to theoretical contributions, this study has some important practical implications. First, there does appear to be moderate-level practices implemented by

nature tourism operators in a variety of pro-environmental operations (the mean of the composite PEB scale is .65, meaning a 65% implementation rate of PEBs). In particular, five of the eight surveyed PEBs [i.e., Natural Resource Conservation ($M = 87\%$), Waste Management ($M = 79\%$), Recycling and Energy Conservation ($M = 79\%$), Responsible Purchasing ($M = 77\%$), and Environmental Communication ($M = 62\%$)] were well practiced by tourism operators in an implementation rate ranging 60% - 80%. This environmental management issue has barely been reviewed and studied by nature tourism academia and professionals and therefore needs to be acknowledged and advocated by governmental agencies, community organizations, and business associations in nature tourism and outdoor recreation sectors. On the one hand, tourism operators in the private sector have substantive capacity and play a vital role in directing and influencing tourism activities and facilities in their operation towards the ultimate goal of environmental sustainability (Tapper, 2001). On the other hand, one does not over-emphasize tourism operators' impacts on natural environment conservation, since the core value between moral and commercial is oftentimes hard to distinguish for operators (Curtin & Wilkes, 2005). Operators tend to risk violating licensing requirements for revenue purposes but damage ecological fragile areas (McKercher, 1998). Given the fact that the surveyed operators reported 2.22 employees per business on average, a common predicament of nature tour operators/managers running a marginally viable business is "making less revenue in exchange for maintaining the state of the environment" in the host community (McKercher, 1998: 194-195). To fully recognize, guide, and encourage nature tourism operators' pro-environmental practices, both sanction and incentive policy instruments for nature tourism business operations ought to be designed for and provided to operators

by state and local government agencies to institutionalize nature tourism operators' conformance behaviors (Sirakaya & Uysal, 1997; Sirakaya & McLellan, 1998).

Second, in line with institutionalizing a better policy framework that guides nature tourism business operations, raising tourism operators' awareness of PEBs is equally important through education, training, and other outreach programs by public entities (Gao et al., 2011; Texas A&M Agrilife Extension's Nature Tourism Program, 2015). Reflecting on the causal factors of PEBs in the Value-Belief-Norm (VBN) model, tourism operators' ecological worldviews do not consistently stay positive, in particular two NEP items in the Human Activity Exploitation (HAE) factor were rated below 3 – the midpoint of a 1-5 Likert scale (see Table 4.5). It is of paramount significance for state and local governmental agencies, extension services in land-granted universities, research institutions, and professional associations to enhance tourism operators' awareness of the enormous consequences of environmental degradation induced by human activities (including nature tourism), and, meanwhile, incentivize their adoption of PEBs with the tremendous impacts on conserving the natural environment and resources.

Last but not least, the collective actions by governmental agencies in tourism and recreation management, nature tourism businesses, and nature tourists will be essential to achieve environmental sustainability and revive the nature tourism industry for economic sustainability. Better understanding tourism businesses' pro-environmental practices and their needs of resources, time, and opportunities is very important to build a consensus of promoting PEBs for every stakeholder group engaged in this collective effort. The survey responses to the PEB antecedents in the TRA model illustrated the lack of high-level perceived behavioral control (PBC), whose mean scores were the lowest in the three

predictors of PEI [attitudes towards the behavior (AT), subjective norms (SN), and PBC]. Being the first systematic survey of nature tourism operators about their PEBs, this research calls for the attention and interests from all the stakeholders in the nature tourism industry and management arenas as well as further endeavors of surveying businesses and tourists concurrently and constantly.

5.3 Research Limitations and Recommendations for Future Research

As with all other empirical studies, this research has its limitations. First, the response rate was only about 11.1% and the valid response rate was even smaller at 6.4%. An inherent problem comes after a sample with a low response rate, which may not be exactly representative of all nature tourism operators in the State of Texas. Nonetheless, it is clear from Table 4.1 that the sample is relatively diverse with respect to tourism operators' personal characteristics, business characteristics, and primary focus of nature tourism. In any event, over-representation of some respondent categories (e.g., the sample is predominantly comprised of elderly whites whose businesses are open year-around) would produce bias in judgments of attitudinal and behavioral variables in TRA and VBN models only to the degree these latter variables are correlated with personal or business characteristic variables. However, only size of business (SB) and whether being owned by family or operator (OFO) were incorporated in the TRA model. Table 4.6 shows that such correlations are either mostly nonsignificant or low in this sample. Moreover, reports by Curtin, Presser, and Singer (2000) and Keeter et al. (2000) indicate low response rates do not appear to bias central tendency estimates such as means and proportions, although perhaps a larger response rate might have found more significant

correlations. Additionally, Han and Kim (2010) point out that in hospitality customer surveys the response rates range from 8.1% to 17.1%. This may provide some consistent evidence of low response rates of surveys in the broader tourism and hospitality sector, including the surveyed tourism operators in this study.

In a nutshell, three factors had impacted the survey response rate. One is that the survey distributed throughout Texas primarily in September – October 2017, is a concomitant of the catastrophic Hurricane Harvey that battered southeast Texas. Another thing is that the responded tourism businesses were predominantly family or operator owned ($M = 81\%$) and desperately evacuating from hurricane-impacted areas and later recovering their businesses. Last, a number of tourism and outdoor recreation professional associations in Texas were reached out to but none of them had offered assistance in distributing the web survey with members. Given the survey impediments above, the response rate of the tourism operator study is relatively reasonable.

To improve the response rate of tourism operator surveys, four potential approaches are worth to explore in the data collection phase. First, it is always recommended to recruit more tourism businesses whether or not they operate virtually. Many small businesses may be established as online services in operating and/or facilitating nature tourism activities. Future research is suggested to recruit such online businesses via social media portals and their professional associations. Second, door-to-door visits with local tourism businesses and conducting a questionnaire survey in person can significantly enhance the response rate. The third method is to get an endorsement from someone respected by the local tourism businesses, e.g., if the head of the local Chamber of Commerce encouraged members to participate in a business survey. The fourth is to

provide some incentives for survey participation, which may require funding for survey rewards or provide programmatic and/or technical assistance with the participated business operators as non-monetary rewards. Another non-monetary approach would be to recognize the participating businesses online, where the public can access, with built-in software such as record keeping or following their finances.

A consequence of the response rate was a modest sample size ($N = 89$), which limited the study's statistical power to detect small correlations or differences as statistically significant. Thus, any correlation less than .18 was classified as nonsignificant (see Table 4.6 and Table 4.7). Since a correlation coefficient of this magnitude could make a meaningful contribution to the interpretation of a dependent variable, future studies should attempt to collect larger samples that would generate a greater statistical power.

A related issue about the study's limited statistical power caused by a small sample is the low R^2 coefficients of the regression models in predicting PEB (26% for TRA and 10% for VBN). A larger sample would likely provide a stronger statistical power in regression analyses as noted for the correlational analyses. Another potential way to enhance the interpretative ability of the regression models (i.e., increasing the R^2) is recommended for future research to explore additional business characteristics (e.g., number of years in business operation, annual gross revenue) and business operator personal characteristics (e.g., educational attainment, professional experience) as independent variables. Finally, the wide adoption of TRA and VBN models in tourism and hospitality behavioral research does not exclude extending the methodological

interests in applying other effective theoretical models in socio-behavioral studies to understanding tourism operators PEBs.

Due to the small sample size, a first generation statistical tool – factor analysis and regression – was utilized in this study and rendered sound statistical results in a step-by-step solution (Gefen, Straub, & Boudreau, 2000). In comparison, most extant studies about PEBs have applied a covariance-based structural equation modeling (SEM) as a path analysis technique built in mainstream SEM statistical software packages (e.g., AMOS, MPlus, LISREL). However, one of the requirements for the covariance-based SEM is a larger sample with more than 200 observations (Myers, Ahn, & Jin, 2011). For future tourism business studies that acquire a smaller sample, it is suggested to rely on an alternative algorithm – partial least squared based SEM (PLS-SEM), which can resolve the problems of small sample size and non-normal data. A better fit of PLS-SEM for behavioral research has been recently recognized by the tourism and hospitality scholarship (e.g., Valle & Assaker, 2016; Ali, Kim, Li, & Cobanoglu, 2018; Mehmetoglu, 2012).

Another limitation of this study is aggregating nature tourism businesses in four different segments (i.e., hunting, fishing, adventure tourism, and agritourism), while overseeing the distinctive orientations of these subcategories of nature tourism and the potential variations in adopting PEBs. For example, agricultural tourism, as a diversification of agricultural income to farmers who are also farm tourism operators (Ollenburg & Buckley, 2007; Choo & Jamal, 2009), can be very different in the tourism activity setting in comparison to adventure tourism. Segment-specific investigations on one selected nature tourism business type are strongly recommended for future tourism

operator research. In addition, cross-segment studies in the nature tourism industry (e.g., fishing vs. hunting vs. adventure tourism vs. agritourism) are also needed to find out the different orientations and purposes for tourism operators to adopt and implement PEBs.

5.4 Conclusion

This study investigated the pro-environmental behaviors (PEBs) of nature tourism business operators in Texas. Theory of Reasoned Actions (TRA) and Value-Belief-Norm Theory of Environmentalism (VBN) were employed to the explanation of eight classified PEBs, including waste management, recycling and energy conservation, natural resource conservation, responsible purchasing, selecting low-impact transport, suggesting environmental friendly accommodation, environmental communication, and donating to environmental entities. Via a web survey of nature tourism operators, the present study aimed to explore plausible antecedents of nature tourism operators' PEBs and compare the two theoretical models' effectiveness. The findings imply that the majority (six out of the eight) of PEBs were implemented by close to or over half of the nature tourism operators. By averaging the eight PEBs into a composite scale PEB, the application of the TRA model shows PEB was significantly predicted by pro-environmental intension (PEI), which in turn was explained by nature tourism operators' attitudes towards PEBs (AT) and subjective norms (SN). The VBN model also proved to be an effective model in significantly regressing PEB on sense of obligation to take PEBs [a.k.a., personal norms (PN)]. In a chain of predictive models, PN was further explained by a few belief factors, including ascription of responsibility (AR), awareness of consequences (AC), and some ecological worldviews [i.e., nature-human tension (NHT)] respectively. At the end of the

VBN path model, altruistic values (AV) and egoistic values (EV) from two opposite sides led to the NHT worldview of the environment. Lastly, through a hypothesis-testing procedure, the TRA model was proven a better theory than the VBN model in interpreting nature tourism operators' PEB.

These empirical findings should be conveyed to tourism managers in the governmental agencies and extension services so they can better understand the nature tourism businesses' preference over and compliance with PEBs and institutionalize pro-environmental operations towards them through regulations, incentives, and educational programs. The findings should also be returned to the nature tourism profession, including individual business owners and operators as well as professional associations of nature tourism activities, so they can reflect on their practices in sustainable tourism development and management.

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APPENDIX 1

INSTITUTIONAL REVIEW BOARD (IRB) APPROVAL FORM

DIVISION OF RESEARCH



EXEMPTION DETERMINATION

April 24, 2017

Type of Review:	Submission Response for Initial Review Submission Form
Title:	Pro-environmental Behaviors of Nature Tourism Operators in Texas
Investigator:	William Mcintosh
IRB ID:	IRB2017-0194
Reference Number:	051585
Funding:	None
Documents Reviewed:	IRB Application v. 1.4 HRPP Informed consent_information sheet_Gao_4.21.17 v. 1.0 Recruitment email_Gao_4.16.17 v. 1.0 Survey Questionnaire v3.0_10.22.16_Coco v. 1.0
Special Determinations:	N/A
Risk Level of Study:	Not Greater than Minimal Risk under 45 CFR 46 / 21 CFR 56

Dear William Mcintosh:

The HRPP determined on 04/24/2017 that this research meets the criteria for Exemption in accordance with 45 CFR 46.101(b) under category Category 2: Educational tests unlinked to individuals and no risks from disclosure .

Your exemption is good for five (5) years from the Approval Start Date. At that time, you must contact the IRB with your intent to close the study or submit a continuing review form through iRIS.

If you have any questions, please contact the IRB Administrative Office at 1-979-458-4067, toll free at 1-855-795-8636.

Sincerely,
IRB Administration

750 Agronomy Road, Suite 2701
1186 TAMU
College Station, TX 77843-1186

Tel. 979.458.1467 Fax. 979.862.3176
<http://rcb.tamu.edu>

APPENDIX 2.

TEXAS NATURE TOURISM BUSINESS SURVEY



<https://www.flickr.com/photos/shookphotos/4638182099>

Texas A&M University
Department of Recreation, Park and Tourism Sciences

Default Block

Thank you for participating in our study of pro-environmental behaviors (PEBs) in nature tourism operations. The time to complete the survey is estimated to average 10-15 minutes per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining data needed, and completing and reviewing the collection of information. Please send your comments and suggestions, if any, regarding this Internet survey to Xiangping 'Coco' Gao (PhD Candidate, Department of Recreation, Park and Tourism Sciences, Texas A&M University) at xiangpinggao@tamu.edu.

Block 1

Did you practice any of of the following *pro-environmental behaviors (PEBs)* as a nature tourism operator for your business in the previous 12 months?

	No	Yes
a. Waste management	<input type="radio"/>	<input type="radio"/>
b. Recycling and energy conservation	<input type="radio"/>	<input type="radio"/>
c. Natural resource conservation	<input type="radio"/>	<input type="radio"/>
d. Responsible purchasing	<input type="radio"/>	<input type="radio"/>
e. Selecting low-impact transport	<input type="radio"/>	<input type="radio"/>
f. Suggesting environmental friendly accommodation	<input type="radio"/>	<input type="radio"/>
g. Environmental communication	<input type="radio"/>	<input type="radio"/>
h. Donating to environmental entities	<input type="radio"/>	<input type="radio"/>

Block 2

To what extent would you agree on the following statements about *intentions* of PEBs?

	Not at all	Small extent	Moderate extent	Great extent	Very great extent
a. I plan to engage in PEBs in the next 12 months.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. I will try to engage in PEBs in the next 12 months.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Block 3

Rate your *attitudes* towards PEBs in nature tourism operations.

	Extremely bad		Neutral		Extremely good
a. I believe PEBs in nature tourism operations are...	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Extremely undesirable		Neutral		Extremely desirable
b. I believe PEBs in nature tourism operations are...	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Extremely harmful		Neutral		Extremely beneficial
c. I believe PEBs in nature tourism operations are...	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Extremely foolish		Neutral		Extremely wise
d. I believe PEBs in nature tourism operations are...	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Block 4

To what extent would you agree on the following statements about *subjective norms* of PEBs?

	Strongly disagree		Neutral		Strongly agree
a. Most people who are important to me think I should engage in PEBs to reduce the impact of nature tourism.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. Most people who are important to me approve my engaging in PEBs to reduce the impact of nature tourism.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Block 5

Rate your *perceived behavioral control* of PEBs in nature tourism operations.

	Extremely difficult		Neutral		Extremely easy
a. For me to engage in PEBs is...	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. I have enough money, time, and opportunities required to perform PEBs.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Block 6

To what extent would you agree on the following statements about *personal norms* of PEBs?

	Strongly disagree		Neutral		Strongly agree
a. I feel personally obliged to reduce the environmental impact of nature tourism.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Strongly disagree		Neutral		Strongly agree
b. Regardless of what others do, I feel morally obliged to preserve the nature tourism environment.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. I feel guilty when I don't preserve the nature tourism environment.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Block 7

To what extent would you agree on the following statements about *ascription of responsibility* for PEBs?

	Strongly disagree		Neutral		Strongly agree
a. I feel jointly responsible for the environmental impacts of nature tourism activities.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. I am NOT concerned about the environment for nature tourism.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Block 8

To what extent would you agree on the following statements about *awareness of consequences* for PEBs?

	Strongly disagree		Neutral		Strongly agree
a. Nature tourism activities cause environmental impacts (e.g., water pollution, exhaustion of natural resources).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. PEBs in nature tourism help to minimize the environmental degradations.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. Protection of the environment in which nature tourism is operated is beneficial for us all.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Block 9

Rate your agreement on the following *New Ecological Paradigm (NEP)* scales.

	Strongly disagree		Neutral		Strongly agree
a. We are approaching the limit of the number of people the earth can support.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. Humans have the right to modify the natural environment to suit their needs.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. When humans interfere with nature it often produces disastrous consequences.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. Human ingenuity will insure that we do NOT make the earth unlivable.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e. Humans are severely abusing the environment.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f. The earth has plenty of natural resources if we just learn how to develop them.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
g. Plants and animals have as much right as humans to exist.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
h. The balance of nature is strong enough to cope with the impacts of modern industrial nations.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
i. Despite our special abilities humans are still subject to the laws of nature.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
j. The so-called "ecological crisis" facing humankind has been greatly exaggerated.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
k. The earth is like a spaceship with very limited room and resources.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
l. Humans were meant to rule over the rest of nature.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
m. The balance of nature is very delicate and easily upset.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
n. Humans will eventually learn enough about how nature works to be able to control it.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
o. If things continue on their present course, we will soon experience a major ecological catastrophe.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Block 10

Rate the extent of importance of the following *environmental values*.

	Not at all	Small extent	Moderate extent	Great extent	Very great extent
a. A world of beauty.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. Respecting the earth, harmony with other species.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. Preventing pollution, conserving natural resources.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. Protecting the environment, preserving nature.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e. A world at peace.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f. Unity with nature, fitting into nature.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
g. Equality, equal opportunity for all.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
h. Social justice, correcting injustice, care for others.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
i. Social power, control over others, dominance.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
j. Influential, having an impact on people and events.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
k. Wealth, material possessions, money.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
l. Authority, the right to lead or command.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Block 11

Please select the title that best describes the primary focus of your business?

Adventure Tourism

Agritourism

Fishing

Hunting

What tourism activities does your business operate? Select all that apply.

- a. Hiking
- b. Biking
- c. Off Road Vehicles
- d. Paddling
- e. Rafting
- f. Sailing and boating
- g. Bird watching & wildlife viewing
- h. Shelling and beach combing
- i. Caving
- j. Outdoor photography
- k. Stargazing
- l. Swimming and scuba diving
- m. Camping, tent, RV, etc.
- n. Bed and breakfast
- o. Meals featuring farm products
- p. Hayrides
- q. Farm/ranch tours
- r. Direct sales (e.g., roadside vegetables stands and pick-your-own produce)
- s. Fishing
- t. Hunting
- u. Nature festivals

v. Other

Your business is?

- a. Open year around
- b. Seasonal

Is your affiliated nature tourism business owned by operator/family?

Yes

No

How many employees are in your business?

1

- 2-5
- 6-30
- 31-50
- >50

How many employees does your business have?

- a. Full time
- b. Part time
- c. Contract as needed

Approximately, how many visitors does your business receive annually?

What is the approximate annual gross revenue of your business (in dollar amount)?

Your business zip code:

Block 12

How old are you?

Your age years

What is your gender?

Male

Female

What is your highest level of education?

Less than high school

High school graduate

Some college/vocational school

College graduate

Graduate school

Which of these best describes your ethnic background?

Non-Hispanic

Hispanic Origin

Which of the following best describes your race?

White

Black

Asian or Pacific Islander

American Indian or Alaskan Native

What is your yearly household income?

\$30,000 or less

\$30,001 - \$45,000

\$45,001 - \$60,000

\$60,001 - \$75,000

\$75,001 - \$90,000

\$90,001 or more

How many people are in your household?

Number of the people in your household

Under 18 years

18-65 years

Over 65 years

Do you have any additional comments about this survey?

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