Antecedents of Effective Environmental Management:

A Test of the Value-Belief-Norm Theory

by

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ABSTRACT

The purpose of this quantitative study is to test the validity of a behavioral theory, value-belief-norm theory (Stern, 2000), in the context of environmental hotel management. The lack of theoretical consideration in previous studies on environmental attitudes of hotel/resort managers warrants an investigation of a theory with the potential to better explain behaviors that support the goals of environment management systems. The goal of this research was to document the values, beliefs, personal norms, and environmental management support behaviors of managers in a hospitality setting. Data were collected from a sample of hotel and resort managers in the Phoenix metropolitan area by using a survey of well-documented items from previous research on the theory. Results suggest the value-belief-norm theory is successful in explaining environmental management support behaviors. Implications for practitioners as well as researchers are discussed.

This thesis is dedicated to my parents, Michael Rubin and Sidney Simonian, and

my family for their encouragement, support and love.

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Introduction

The rapid growth of the tourism industry since 1950 (UNWTO, 2009) warrants an investigation into the environmental impacts of the industry's different sectors. The accommodations sector has been a focus of the literature due to excessive consumption of resources and accumulation of waste (e.g., Chan & Lam, 2001; Chen & Hawkins, 2001; Kasim, 2009; Kirk, 1995)**.** Environmental management has emerged as one approach to conserving resources and preserving the environment (Kirk, 1995). In this context, environmental management is defined as a strategic business model that considers the organization's impacts on the environment in policy-making, planning, training, procedures, communication, reviews, and continual improvements (e.g., Chen & Hawkins, 2001; Kirk, 1995; Mensah, 2006). The success of this approach relies on employees, which is one reason why studies of hotel managers' attitudes have emerged in the tourism and environmental management literature (e.g., Bohdanowicz, 2006; Kasim, 2009; Kirk, 1998; Stabler & Goodall, 1997). Such studies provide valuable information on managerial perceptions of environmental business practices. These studies, however, have tended to lack meaningful psychological explanations of the influence human values, beliefs, and attitudes have on the resulting environmental support behaviors.

Theoretical research on the accommodations sector and its behaviors toward the environment (i.e., environmental management) has been given little attention in the tourism field. Hotels in the developed world have been under increasing pressure from policy-makers and even guests to change their

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operations toward more sustainable practices (Claver-Cortes, Molina-Azorin, Pereira-Moliner & Lopez-Gamero, 2007; Kasim, 2009; Kirk, 1995, 1998; Mensah, 2006). This push towards environmental management has been studied objectively (i.e., water use, energy use, and waste production) and subjectively (i.e., attitudes and perceptions). There is a wealth of information on resource usage (e.g., Bohdanowicz, 2006; Hobson & Essex, 2001; Kasim, 2009; Kirk, 1995; Mensah, 2006) and personal views about the environment (e.g., Hobson & Essex, 2001; Kasim, 2009; Mihalic, 2000; Stabler & Goodall, 1997; Tilley, 1999; Tzschentke, Kirk, & Lynch, 2004) pertaining to the hotel industry. This body of knowledge, however, is often unorganized and lacking adequate theoretical foundation; these studies often lack internal and external validity and reliability thus limiting the confidence in the conclusions and generalizability of the results.

Purpose

The purpose of this quantitative study is:

1. To investigate the extent to which environmental management practices in the hotel industry can be explained by a behavioral theory.

Objective

The objective of this study is to understand the psychological antecedents of effective environmental management in the accommodations sector. This investigation will test explanatory power of the value-belief-norm (VBN) theory (Stern, 2000; Stern, Dietz, Abel, Guagnano, & Kalof, 1999) in regard to environmental management support behaviors in the accommodations sector. To test the explanatory power of the VBN theory, a survey will be distributed to hotel

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managers within the Phoenix metropolitan area in Arizona. The survey will include sections on values, beliefs, personal norms, and environmental management support behaviors, as well as demographic sections on the manager(s) and the hotel property.

Significance

This study is directed towards multiple audiences. The implications of this study will extended to practitioners as well as researchers. The results of this study will help hoteliers and policy makers effectively implement environmental management systems by providing evidence for the consideration of employee environmental views in addition to more objective measurements of environmental management, such as: environmental impacts, economic impacts, and marketability. This study is also directed toward tourism, sustainability, and psychology researchers. By presenting a study of practitioner applications embedded in a well-corroborated theory, future researchers may be more inclined to use the VBN theory when investigating environmental management support behaviors from different industries.

The Hotel Industry and Tourism

Due to the increasing scope of the tourism industry, the negative effects on the environment are numerous and often region-specific. One of the biggest contributors to these effects is the accommodations sector (Bohdanowicz, 2006; Hobson & Essex, 2001; Kasim, 2009). Accommodations are essential components of the tourism experience because they offer shelter for people exploring different regions of the world; because of this, hotels have a great influence on destinations

as well as the environment. The growing concern of environmental sustainability has prompted hotels to decrease their negative impacts, however the question still remains: how effective are these environmental management policies? Hotels are known for their excessive catering to tourists and business travelers. As a result, resources and products are often wasted. Resources, in the way of energy and water, are lost due to the "24-hour" nature of the accommodations business, as well as guest negligence (Bohdanowicz, 2006; Butler, 2008; Chan & Hawkins, 2010). Products, in the way of toiletries and food, are also wasted. Hotels must compensate for their consumption of resources and waste produced, while at the same time give guests a satisfying experience.

Sustainability

Definition. A universal definition of sustainability has been disputed for decades (e.g., Brown, Hanson, Liverman & Merideth, 1987; Gatto, 1995; Saarinen, 2006), resulting in myriad definitions emerging from different schools of thought. For example, Gatto (1995) identified three definitions, which all deal with the responsible yield of resources and ecological protection. These definitions, however, are often framed by different contexts (i.e., applied biology, ecology, and economy). Until a universal definition can be agreed upon, the present research will adopt a context-specific definition.

For the purposes of this study, the definition of sustainability will be drawn from the perspective of the tourism industry. The definition of sustainable tourism had been influenced by earlier research on the concept of carrying capacity, which is typically defined as the extent to which people can use a site

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without negatively altering the environment or the quality of experience for others (Saarinen, 2006). This implies a scale-dependent context. Theoretically, this would lead to a definition of sustainability that considers locality as well as the traditional environmental, economic, and social components of sustainability. Therefore, the definition of sustainability used in the present study is taken from Choi & Sirakaya's (2006) research on sustainable community tourism: "[sustainable tourism] aims to improve the residents' quality of life by optimizing local economic benefits, by protecting the natural and built environment and provide a high-quality experience for visitors" (p. 1275).

Sustainability and tourism. Sustainability, defined broadly, has become a goal of the tourism industry in the past few decades. Real-world applications of sustainability, however, have been criticized for their lack of measurements and results (Bohdanowicz et al., 2001; Mensah, 2006; Stabler & Goodall, 1997). It appears sustainability has become a driving force in the tourism industry (Stabler & Goodall, 1997) with a range of potential sustainable practices (Bobbett, 2010); unfortunately the term has been used as more of a marketing tool (Mihalic, 2000) rather than a commitment to deal with the negative effects of human behavior on the environment.

Within the hotel industry managers encounter all three sustainability components on a daily basis. The social and economic aspects are often priorities in order to sustain guest satisfaction and remain financially sound. Albeit at a slow pace, environmental aspects of sustainability are becoming recognized within hotels. There are at least three key issues that shed light on the difficulties

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of implementing environmentally sustainable policies and practices; these are, water usage, energy consumption, and waste management (Mensah, 2006). The following sections will address these issues as they pertain to the hotel industry.

Water usage. The overuse of water in the accommodations sector is often a result of high-pressure showers, frequent laundering of linens and towels, as well as swimming pools and saunas (Kirk, 1995). A majority of the challenge to use water in a sustainable manner heavily depends on the consent of guests (Kirk, 1995), for example, water pressure and voluntary towel and linen policies. To minimize water waste, some hotels have installed dual pipe toilets (e.g., Novotel, Nadi, Fiji, and The Grace Hotel, Sydney, Australia) that regulate water flow (Mensah, 2006). These practices are noble steps toward water sustainability, however constraints such as shower quality and guest satisfaction continue to challenge water conservation efforts in the hotel industry.

Energy consumption. In the 1980's the tourism literature began to focus on hotel energy efficiency (Chan & Lam, 2001). Energy use is a major concern for hotels (Mensah, 2006) due to high operational costs and guest negligence (Tzschentke, Kirk & Lynch, 2004). If fact, guest behaviors are one of the major reasons for implementing energy saving devices (Tzschentke et al., 2004); as illustrated in this response from a guesthouse owner: "I get irritated at the way some guests waste our electricity…they go out in the evening and all the rooms lights' will be left on, heating full on and nobody there!" (p. 118-119). Much like water use issues, guest expectations (e.g., expectations of available hot water) constrain energy-saving efforts (Kirk, 1995); the implementation of sustainable

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energy practices must be organized in a way that guests "do not notice any deterioration of service" (p. 3).

Waste management. Waste was not prevalent in hospitality literature until the early 1990's (Chan & Lam, 2001). There are many sources of waste in the hotel industry from disposable shower amenities (Bobbett, 2010) to uneaten food (Kirk, 1995). Attempts to decrease the amount of hotel waste have considered programs that recycle 50% or more (Bohdanowicz, 2005), and refillable shampoo and conditioner units (Bobbett, 2010), to name a few. In addition to the negative environmental impacts, a major issue in waste management is the transportation of waste and recyclables, especially in remote tourist destinations (Mensah, 2006). Waste transportation is associated with increased financial costs (e.g., cleaning companies and private waste contractors) (Chan & Lam, 2001) that place added pressure on hotels to find alternatives in waste management.

Phoenix and the Southwest. Sustainability issues such as, water usage, energy consumption, and waste management, are region specific (Wahab & Pigram, 1997). Hotels, no matter their location, should consider external variables when developing sustainable practices to ensure balance within their communities. This present study will survey hotel managers from the Phoenix metropolitan area. To do this, a better understanding of the location, and the hotel industry within it, is warranted. This section will illustrate important demographic and geographic features of Phoenix, Arizona and the southwest, as well as significant industry characteristics.

Phoenix is located in the southwestern region of the United States. With a population approaching 1.6 million, this desert city experiences over 300 sunny days a year and an average temperature of 74 degrees (City of Phoenix, 2011a). During the summer months, however, the average temperature rises above 100 degrees. Phoenix's favorable weather, range of outdoor activities, and proximity to popular attractions (e.g., the Grand Canyon) has made the city a premier tourist destination. The Phoenix accommodations industry features 500 hotels that offer 30 or more rooms, and there are 59,000 resort and hotel rooms citywide (City of Phoenix, 2011a). Although Phoenix's hotel rooms are outnumbered by other destination cities, such as: Los Angeles (LA Inc., 2010) and Las Vegas (Las Vegas Convention and Visitors Authority, 2011), Arizona's climate and geography, together with Phoenix's growing population and image as a tourist destination, creates unique sustainability challenges. For example, Phoenix's hot summer months create issues related to increased energy consumption (e.g., air conditioning), increased water consumption (e.g., landscaping), and decreased occupancy rates. Efforts by the City of Phoenix to reduce negative environmental impacts have led to the implementation of over 80 sustainable practices and projects, including a climate action plan, commissions on environmental quality, and environmental management systems within the Transportation and Parks and Recreation departments (City of Phoenix, 2011b). Progress has been made in sustaining this city's resources, however, awareness and support are necessary for the continued success of local environmental movements (Stern, 2000), especially within a large tourist destination such as Phoenix.

Literature Review

Introduction

Within the tourism industry there has been an increasing focus on efficiency and environmental conservation. This is most evident in the emergence of sustainable practices, such as "towel policies" and motion-activated guestroom lighting in hotels (Mensah, 2006). In terms of marketing, these sustainable practices give some tourism sectors a financial advantage over others; for instance, with the growing awareness of negative environmental impacts, hotel guests are more inclined to patronize establishments that make positive efforts toward the environment (Bader, 2005). On the other hand, environmental management systems in the hospitality sector are faced with many implementation hurdles, including the psychological disposition of individuals in charge.

In the accommodations sector, a growing awareness of sustainability in the past few decades (Kirk, 1995) has given rise to concerns about the effects of human behavior on the environment. Attempts at correcting imbalances within our environment (in the form of sustainable business practices and policies) have been widely implemented (Merritt, 1998). Within the industry, these practices and policies have been recognized as environmental management by researchers (i.e., Kirk, 1995; Kasim, 2009), practitioners, as well as peer-reviewed journals (i.e., *Environmental Management* and *Journal of Sustainable Tourism*). Past research on environmental management has produced divergent results in the accommodations sector. For example, studies have shown that the use of

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environmental management in the hospitality sector is effective if the hotels receive compensation in the way of lower costs and higher profits (Mihalic, 2000; Stabler & Goodall, 1997). Other research has pointed to a need for region specific action in order for environmental management to be successful (Kirk, 1998; Mensah, 2006; Stabler & Goodall, 1997). Thus, calling for environmental practices and policies that are economically beneficial to the hotel properties while at the same time taking into account the local environments around hotel properties (which may result in costlier techniques). The heavy burden of implementing these environmental business practices, as well as providing a satisfying experience for guests, rests on the shoulders of the hotel's management.

This research study aims to examine the perceptions of the emerging environmental management trend in the accommodations sector. To accomplish this goal, environmental management will be investigated using a behavioral theory. The review of the literature will focus on the origins, definitions, and applications of the environmental management concept and the Value-Belief-Norm (VBN) theory (Stern, 2000; Stern, Dietz, Abel, Guagnano, & Kalof, 1999) in order to understand and justify the present research study. The purpose of this literature review is to place this study within the context of past and current research by demonstrating the uses of the VBN theory, and how it applies to the environmental behaviors of hotel managers. To link the VBN theory to the domain of hotels and their sustainable business practices, environmental management will be examined as the behavioral outcome of the VBN theoretical model.

Environmental Management

The concept of environmental management refers to the incorporation of
environmentally sustainable practices and policies into business strategies and
methods (Claver-Cortes, Molina-Azorin, Pereira-Moliner, & Lopez-Gamero,
2007: Kasim, 2009; Kirk, 1995; Kirk, 1998; Mensah, 2006; Stabler & Goodall,
1997). In the hospitality sector, this concept has been introduced in many
destinations around the world, for instance: England (Hobson & Essex, 2001;
Kirk, 1995, 1998; Merritt, 1998), Spain (Clever-Cortes et al., 2007), Ghana
(Mensah, 2006), Kuala Lumpur (Kasim, 2009), Poland (Bohdanowicz, 2006),
Scotland (McDonagh, Moutinho, Evans, & Titterington, 1992), and Sweden
(Bohdanowicz, 2006). This approach aims to improve hotel performance levels
while considering the environmental impacts of managing a hotel (Claver-Cortes
et al., 2007). Environmental management incorporates all aspects and operations
of a hotel and attempts to balance the environmental, social, and economic
impacts of the property. For example, Kirk (1995) discusses environmental
management in terms of organizational principles. Environmental management
incorporates principles such as: formulating environmental policy, ensuring total
commitment of all in the organization, carrying out an environmental review,
determination of responsibilities within the organization, preparing a register of
environmental effects, establishing objectives and targets, implementing
management systems, commissioning periodic environmental audits, and
performing regular systems reviews based on performance (British Standard BS
7750: Environmental Management Systems, *as cited in* Kirk, 1995).

Researchers and practitioners have used the concept of environmental management for many years, with applications to several industries (Merritt, 1998). The hotel industry, however, has been a focus of environmental management in research and practice due to the magnitude of the industry's use of resources (i.e., Bohdanowicz, 2006; Hobson & Essex, 2001; Kasim, 2009; Kirk, 1995; Mensah, 2006). Studies in this area use attitude measurements in order to judge the impact of environmental management (Hobson & Essex, 2001; Kasim, 2009; Stabler & Goodall, 1997; Tilley, 1999; Tzschentke, Kirk, & Lynch, 2004). To the best of the researcher's knowledge, the attitudes of hotel managers have been the basis for generalizations about hotel properties and their use of sustainable business practices. Many studies attribute this assumption to the manager's position of authority (Kasim, 2009; Kirk, 1995, 1998; Mihalic, 2000). The effective use of environmental management, however, is not always contingent on the hotel manager. For example, hotels usually implement environmental initiatives that have large workforces and large financial capital (Kasim, 2009), while the decision to implement environmental management systems by smaller hotels is less effected by these conditions. Smaller hotels usually do not have a board of directors, or an advisory board to make decisions. With larger hotels, there is great pressure from company stakeholders in addition to policy makers to cut costs and protect the environment, whereas smaller hotels are less regulated is this sense (Kasim, 2009).

Environmental management is a fairly new concept in the realm of sustainability, which is one of the reasons why attitudinal research on hotel

managers has emerged (Hobson & Essex, 2001; Kasim, 2009; Stabler & Goodall, 1997; Tilley, 1999; Tzschentke, Kirk, & Lynch, 2004). Managerial attitudes have been the focus of such studies due to the manager's involvement in hotel operations (Kasim, 2009; Kirk, 1995, 1998; Mihalic, 2000), and their representation of the company as a whole (Park & McCleary, 2010). Managerial values, beliefs, and norms about the environment have a great effect on the current and future implementation of sustainable practices. The research on environmental management has drawn on vague theoretical perspectives (i.e. sustainable development theory) and has used many different methodological approaches (Claver-Cortes et al., 2007; Hobson & Essex, 2001; Kasim, 2009; Mensah, 2006; Merritt, 1998; Tzschentke, Kirk, & Lynch, 2004); the majority concerned with the managerial attitudes towards the practicality, feasibility, and marketability of sustainable practices and policies. The overarching results of these attitudinal studies point to an awareness of environmental impacts, and an understanding of the need for hotels to participate in environmental management (Bohdanowicz, 2006; Hobson & Essex, 2001; Kasim, 2009; Kirk, 1995, 1998; Mensah, 2006). Unfortunately, this lack of focus in the research illustrates a field that is still developing. There seems to be a need for theoretical foundation in environmental management in order to give the research direction and produce real-world solutions to the negative impacts of tourism on the environment.

Attitudinal studies on hotel managers towards environmental management are rarely based in theory (e.g., Le, Hollenhorst, Harris, McLaughlin, Shook, 2006). Although the implications of these studies are geared towards helping

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managers and policy makers implement sustainable practices, there is a gap

between what managers think about sustainable practices and their behaviors

towards the practices. For example, Kasim (2009) reported overwhelmingly

positive responses from hotel managers to the practicality of sustainable water

and energy use, however actual usage of water and energy by the majority of

these hotels were excessive.

In order to correct these imbalances in the research, the present study will

employ the use of a theory to explain the implementation of environmental

management in the hotel industry. It is important to have a theoretical foundation

in research in order to better understand the purpose of the study and to rationalize

the results. The lack of theory in the environmental management field leads to

questions about the validity and implementation of these management practices.

Value-Belief-Norm Theory

Stern and colleagues developed the Value-Belief-Norm (VBN) theory in

the late nineties. The theory has been used to study the factors that effect social

movements, specifically environmental behavior (Stern, Dietz, Abel, Guagnano,

& Kalof, 1999). The VBN theory draws from value theory (Schwartz, 1992),

norm-activation theory (Schwartz, 1973, 1977), and the New Ecological Paradigm

(NEP) perspective (Dunlap & Van Liere, 1978; Dunlap, Van Liere, Mertig &

Jones, 2000), and proposes a chain model (see Figure 1) with direct connections

between five variables that are antecedents of environmental behaviors (Stern,

2000). These variables are values (biospheric, altruistic, and egotistic), ecological

worldviews (NEP), adverse consequences for valued objects (AC), perceived

ability to reduce the threat (AR), and personal norms (the sense of obligation to take pro-environmental actions) (Stern, 2000). These variables, in the causal chain, have been shown to explain pro-environmental behaviors (Eriksson, Garvill, & Nordlund, 2006; Steg, Dreijerink & Abrahamse, 2005; Stern, et al., 1999). The pro-environmental behaviors that are associated with the VBN theory are: environmental activism, nonactivist public-sphere behaviors, private-sphere behaviors, and behaviors in organizations (Stern, 2000). The VBN theory also postulates that the variables may also directly affect other variables closer to the end of the chain (i.e., values and personal norms) (Schwartz, 1977; Stern, 2000; Stern et al., 1999). Although this theory is mainly used to understand individual environmental behaviors, as applied to the researcher's study this theory will be used to understand the environmental values, beliefs, and norms of hotel managers and their effect on environmental management support behavior. This will be done by generalizing the values, beliefs, norms, and behaviors of hotel managers to a holistic representation of the hotel properties (Park & McCleary, 2010). From this, a better understanding of the perceived advantages and disadvantages to implementing sustainable practices will emerge.
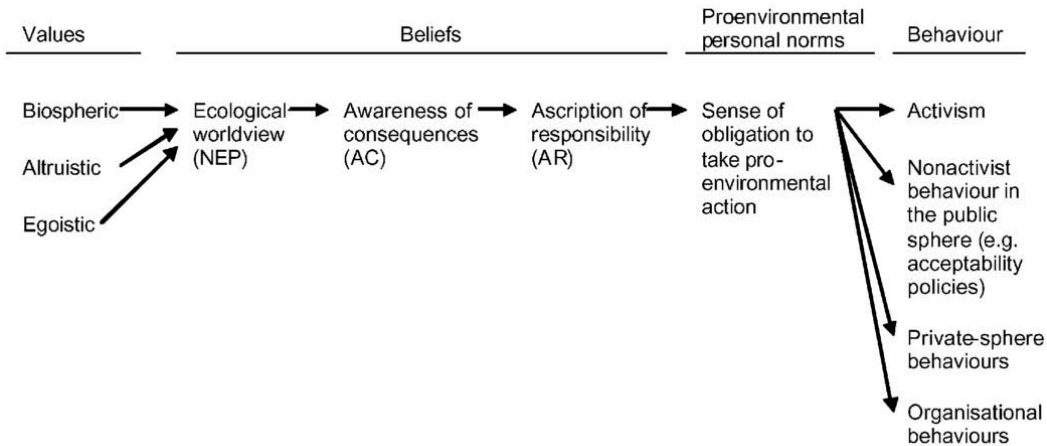
Values | Beliefs | Proenvironmental personal norms | Behaviour

Biospheric → Ecological worldview (NEP) → Awareness of consequences (AC) → Ascription of responsibility (AR) → Sense of obligation to take pro-environmental action

Altruistic

Egoistic

Activism

Nonactivist behaviour in the public sphere (e.g. acceptability policies)

Private-sphere behaviours

Organisational behaviours

Figure 1. Value-belief-norm theory causal chain. Adapted from "Factors influencing the acceptability of energy policies: A test of the VBN theory," by L. Steg, L. Dreijerink, and W. Abrahamse, 2005, *Journal of Environmental Psychology, 25,* p. 419.

Value orientation (biospheric, altruistic, egotistic). The first element of the VBN theory is based on a person's values. Values are considered very stable and unlikely to change (Schwartz, 1977; Steg, Dreijerink & Abrahamse, 2005; Stern, 2000; Stern et al. 1999). Every social movement has an ideology that is based on human values (Stern et al. 1999). Stern (2000) divided the values component into three separate domains: biospheric values, altruistic values, and egotistic values. These values are based on social movements, more specifically environmentalism.

Biospheric values (BIO) are attitudes and beliefs that support different species and natural environments (Stern, 2000). Biospheric values have recently emerged as important components of activism behavior; however, according to Stern (2000) very little empirical evidence has been found to support these values. Originally, Stern et al.'s (1999) model consisted of traditional values and openness to change values in the place of biospheric values. Traditional values

incorporate feelings of duty and family loyalty in order to sustain social order; these values, in addition to openness to change values, were eliminated from the revised model (Stern, 2000). Although there has not been much empirical evidence on biospheric values, Stern and his colleagues incorporated them into the model in order to gain a better understanding of a person's perceptions of the natural environment.

Altruistic values (ALT), unlike biospheric values, are concerned with the well being of other people (Stern, 2000). Altruism is a term to describe attitudes and behaviors that are considered unselfish and are for the greater common good. The altruistic value component in the VBN theory was adapted from Schwartz's (1977) norm-activation theory, which focuses on how altruistic values "activate" personal norms. Stern et al. (1999) believe altruistic values are necessary in the realm of social movements. According to Stern et al. (1999), the environmental movement, among many other social movements, deliberately reference altruistic values in order to gain support from volunteers. Evidence for this connection stems from studies concerned with personal values and how they interact with activism behavior (Cotgrove, 1982; Schwartz, 1994; Snow, Rochford, Worden & Benford, 1986).

The final set of values employed by the VBN theory has been well researched and corroborated with altruistic values in regards to the environmental movement. Egotistic values (EGO) (i.e., self-interest values), along with altruistic values, are based on environmental concern (Stern et al., 1999). In support, Steg, Dreijerink & Abrahamse (2005), whom test the VBN theory on the acceptability

of energy policies, suggest a negative relationship between egotistic and altruistic values. Steg et al. (2005) agree with other researchers that "many pro-environmental behaviors…require the individual to restrain egotistic tendencies to benefit collective interests" (p. 416). Measurements of biospheric, altruistic and egotistic values will be used in the present study to understand the relationship between feelings and pro-environmental behaviors.

Ecological worldview (NEP). The ecological worldview component of the model, according to Stern et al. (1999) is a measure of the New Ecological Paradigm (NEP), which was developed and revised by R. E. Dunlap and his colleagues (Dunlap & Van Liere, 1978; Dunlap, Van Liere, Mertig, Catton & Howell, 1992; Dunlap, Van Liere, Mertig & Jones, 2000). Ecological worldviews are less stable than personal values (Steg, Dreijerink & Abrahamse, 2005); however, the NEP measure is necessary to examine broad beliefs about the environment and the effects of human activity (Stern et al., 1999).

Adverse consequences for valued objects (AC). Moving across the causal chain of the VBN theory model, adverse consequences for valued objects (AC) refers to the threats that human-environmental interactions pose to valued objects (Stern et al., 1999). This concept originated in Schwartz's (1973, 1977) moral norm-activation theory, with an emphasis on altruism. The VBN theory uses the concept of AC; however, it is generalized to any type of valued object, not just altruistic values (Stern et al., 1999). The awareness of adverse consequences to the environment that humans pose, will often lead to perceptions

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of one's ability to reduce the negative consequences (Schwartz, 1973, 1977; Steg et al., 2005, Stern et al., 1999; Stern, 2000).

Perceived ability to reduce the threat (AR). The next link in the VBN causal chain is perceived ability to reduce the threat (AR). According to the theory, AC, and AR are dependent on one's values and ecological worldview (Steg et al., 2005). The AR component, however, was not tested by Stern et al. (1999), with no clear reason was given. In addition, research by Steg et al. (2005) has pointed to a dualism in the use of AC and AR. Their research revealed studies that define general environmental conditions as the focus of AC and AR beliefs, while others have defined AC and AR in terms of behavior specific beliefs. For the purpose of stronger predictability within the VBN theory, the present study will be testing AR and will be focusing on specific behaviors (i.e., toward energy consumption, water use, and waste production).

Pro-environmental personal norms (PN). Researchers have defined personal norms as a feeling of moral obligation to take action (Eriksson, Garvill, & Nordlund, 2006; Schwartz, 1977; Stern, 2000; Stern et al., 1999). According to the VBN theory (Stern et al., 1999), values, ecological worldviews, adverse consequences, and perceived ability to reduce threats activate personal norms. Personal norms, in addition to altruistic values, are the most important and corroborated components of the VBN theory (Schwartz 1977; Stern, 2000; Stern et al., 1999). In the context of social movements (Stern et al., 1999), personal norms that are inline with organization principles are more likely to support the goals of an organization. This use of personal norms has been generalized to other

organizations such as multinational corporations (Andersson, Shivarajan, Blau, 2005). Within the context of multinational corporations, Allen and Meyer's (1990) concepts of "affective commitment" and "continuance commitment" have been used by Andersson et al. (2005) to explain personal norms that affect behaviors. According to Andersson et al. (2005), affective commitments are seen as emotional attachments toward an organization; this also includes employees' personal identification and involvement with an organization. Continuance commitments refer to the engagement in steady activities within an organization due to the perceived consequences of doing otherwise (Andersson et al., 2005). These personal normative constructs are helpful in the exploration of norms within other businesses, such as hotels. In understanding the activators of personal norms (Schwartz, 1977), the VBN theory states that behaviors will arise based on the activated norms.

Behaviors (EMSB). Environmentally specific behaviors are the outcome of the VBN model (Stern, 2000). Due to variations when moving along the causal chain, the outcome behaviors tend to be grouped into four environmental behavior categories (Stern, 2000; Stern et al., 1999). One category is "environmental activism"; the VBN theory, however, has not been successful in accounting for the behaviors of environmental demonstrators (Stern et al., 1999). It appears other undisclosed factors are involved in this type of behavior. One the other hand, personal norms have been shown to elicit behaviors in the last three categories (Stern et al., 1999).

The last three behavioral categories are based on non-activism, which may have implications as to why "activism" behaviors cannot be explained by the VBN theory. The next behavior category is "nonactivist public-sphere behaviors". This type of behavior indirectly effects the environment. Typical behaviors in this category include: petitioning environmental issues, joining and participating in environmental organizations, and supporting public policies such as a willingness to pay higher taxes to preserve the environment (Stern, 2000). According to Stern (2000) public awareness is an important aspect of this behavior type, which leads to a propensity to be influenced.

"Private-sphere behaviors" have been a major focus for researchers. These behaviors refer to the purchase, use, and disposal of products that have environmental consequences (Stern, 2000). Unlike "nonactivist public-sphere behaviors", private-sphere behaviors have direct influences on the environment, which is why these behaviors are important in environmental social movements. These private-sphere behaviors, however, are insignificant unless many individuals replicate them over time.

The last category, "behaviors in organizations", is more general that the last three, however, this category has the greatest implications for the present study. "Behaviors in organizations" refer to individual environmentally friendly acts that people perform in organizations they belong to (Stern, 2000). These behaviors, on a more organized level, coincide with the concept of environmental management. The influences of individuals have the potential to become policy within an organization, which can have great impacts on the environment. The

tendency to perform pro-environmental behaviors within a place of business, however, is different that political or household environmental friendly behaviors (Stern, 2000). Determinants, such as social-psychological and socio-demographic predictors are different for each behavioral type. This calls for the present study to closely examine the behavioral outcome of the VBN test in order to draw connections between specific predictors and behaviors within the hotel organization.

The application of the VBN theory has been successful in explaining the domains of: acceptability of energy policies (Steg et al., 2005), willingness to reduce car use (Nordlund & Garvill, 2003), consumer behavior, environmental citizenship, and willingness to sacrifice (Stern et al., 1999), and multinational pharmaceutical corporations (Andersson et al., 2005). This theory, however, has yet to be used to explain the values, beliefs, and norms of hotel managers when applied to the implementation of sustainable business practices. A lack of focus on organizational behaviors in tests of the VBN theory may be a result of external factors that are present in business settings (Andersson et al., 2005; Stern, 2000). The use and validation of the VBN theory has been sparse in the literature, which is why the VBN theory will be the focus of this present study.

The VBN theory is similar to Ajzen's (1991) theory of planned behavior. Whereby understanding one's personality and its interaction with the environment can help predict actual behaviors. Ajzen's (1991) model proposes that attitudes, subjective norms, and perceived behavioral control affect behavioral intentions, which, in turn, affect behaviors. Both theories are used to explain conservation

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behavior, however, the VBN theory focuses on values and moral norms while the theory of planned behavior focuses on self-interest and rational choices (Kaiser, Hubner, & Bogner, 2005). The two theories have been compared by Kaiser et al. (2005) with respect to environmentalism. This study used measures of attitudes, subjective norms, perceived behavioral control and behavior intention to explore the predictability of each theory. The results of Kaiser et al. (2005) indicated that the theory of planned behavior was more accurate in explaining conservation behavior, even though the VBN theory is superior in terms of the model structure. Although the theory of planned behavior has been widely used and its validity, over the VBN theory, in predicting conservation behavior has been corroborated, this present research study will be using the VBN theory. The decision to base this research on the VBN theory is grounded in the theory's focus on social movements (Stern et al., 1999) and its detailed model structure.

Conclusion

There are important deficiencies in the literature worth noting. These deficiencies have great implications for this study's construction and goals. The most notable gaps with environmental management research are the lack of studies that are focused in the United States, the narrow populations within these studies, and the lack of theoretical considerations within environmental management literature. Many studies involving attitudes and environmental management focus on managerial attitudes alone. This path is completely valid, however, the practices and policies do not stop at the managers. Further studies should incorporate the attitudes of employees who are responsible for

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implementing sustainable practices and policies; this will allow a detailed holistic view of the hotel system. In addition, many environmental management studies lack a theoretical foundation. It is understood that this research is practitioner oriented; however, without theoretical basis for these studies the methods and discussion of results may not be accurate.

The use of theory will position this study in the realm of behavioral psychology. It is the researcher's expectation that this psychological foundation will guide the purpose and findings of this study toward more effective real-world solutions. Presently, the VBN theory will be tested in terms of its "organizational behaviors" outcome. The support of environmental business practices in the accommodations sector will assume the VBN theory's behavioral outcome in this study. Other tests of the VBN theory (Eriksson et al., 2006; Steg et al. 2005; Stern, 2000; Stern et al. 1999) use validation hypotheses to investigate the strength of the causal chain and mediating variables (Steg et al., 2005) within the theory. In addition to these hypotheses, this study's research question is as follows: Can environmental management support behaviors be explained by the VBN theory? The answers to these questions will help future researchers better understand the personal antecedents of pro-environmental behavior within the accommodations sector. In addition, the answers will help illustrate the effectiveness of environmental management by relying on theory to produce practical solutions.

Methodology

Research Approach and Design

The present study is a quantitative research design with the addition of two open-ended questions regarding manager responsibilities and their awareness of the term environmental management. The research assumes a "postpositivist" worldview, meaning the research is concerned with empirical observations and measurements in order to verify a theory (Creswell, 2009). Although this research design employs two open-ended questions, they are not considered part of the theory verification and will only be analyzed as a post-hoc examination of the primary research (i.e., testing the explanatory power of the VBN theory).

The construction of the survey will be based on the methodology of Steg, Dreijerink, & Abrahamse (2005). Steg's et al. (2005) ordering of variables were strategically placed in the survey to account for socially desirable answers from respondents. In addition, Steg and his colleagues test the whole VBN theory as opposed to other tests of the VBN theory (Andersson, Shivarajan, Blau, 2005; Stern, Dietz, Abel, Guagnano, & Kalof, 1999; Nordlund & Garvill, 2003). The present study's survey is comprised of 5 parts. The first part includes items to measure values. The second part is comprised of items pertaining to the support behaviors of managers towards environmental management. The third part includes measurements of personal norms, ascription of responsibility (AR), and awareness of consequence (AC) beliefs. The fourth part is the NEP scale (Dunlap et al., 2000), and the fifth is a demographics section. The following section titled

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"Survey Instrument" will provide a detailed description of each variable in the survey. See Appendix A for a list of survey items.

Research Question and Hypotheses

The present research is guided by a set of research questions and hypotheses. In general, this research is concerned with the following question:

1. Can environmental management support behaviors be explained by the VBN theory?

To help answer this research question, the VBN theory must be validated by testing certain assumptions about the relationships among the variables in the VBN model. The hypotheses in the present study have been adapted from a previous test of the VBN theory (Steg et al., 2005). The first two hypotheses test the actual VBN theory causal chain, while the subsequent hypotheses test mediating effects between variables (Steg et al., 2005). The hypotheses are:

1. Each variable in the VBN causal chain model is related to the next variable.

2. Each variable may be directly related to variables further down the causal chain.

3. Personal norms mediate the relationship between AR beliefs and behaviors.

4. AR beliefs mediate the relationship between AC beliefs and personal norms.

5. AC beliefs mediate the relationship between NEP and AR beliefs.

6. NEP mediates the relationship between values and AC beliefs.

Data Collection and Procedures

Data was collected from July 18th, 2011 to September 12, 2011. During the first week, surveys were distributed via on-site visits and e-mail through an online survey tool. The researcher contacted potential respondents by unsolicited on-site visits. Respondents were briefed on the nature of the survey, how the data will be handled, and how much time the managers would need to answer the questions. Managers that were able to fill out a survey during the visit were given a paper copy and were returned immediately. Business cards would be exchanged and the subject's card would then be stapled to the survey for identification. If a business card were not available, the manager's name, title, and e-mail address would be written on the survey. Managers that could not fill out a survey at the time of visit were asked to complete an online survey, which was sent through e-mail the same day (the researcher exchanged business cards with every potential respondent).

This method yielded 4 paper and 10 electronic responses (out of 26 managers contacted), however issues arose with identifying returned electronic surveys due to the freedom to skip answers; some surveys were returned with blank identification responses, while one wrote the term "N/A" for their responses. Although the online survey was kept open during the entire collection period, the e-mail method was discontinued.

In the remaining weeks of the collection period, e-mail distribution was replaced by a paper distribution method. If managers were unable to complete the survey on-site, a paper copy was provided and business cards were exchanged.

The manager would then be asked to contact the researcher upon completion to arrange the survey's return. The researcher would then write "pick up" on the potential respondent's card for contact via telephone after a week to remind the managers. This method yielded 44 paper and 4 electronic responses.

After 6 nonconsecutive weeks of survey distribution and collection, a total of 62 surveys were returned out of 115 managers contacted, for a response rate of 54%. Due to a miscommunication, however, the survey was distributed to two managers from hotels outside of the United States and will not be included in the analysis. This discrepancy changed the total study sample to N=60 out of 115 managers contacted, for a final response rate of 52%.

Survey Instrument

The following are detailed explanations of the survey sections (i.e., values, support behaviors, personal norms, ascription of responsibility, awareness of consequences and NEP), including origins, item measurements, and response techniques (see Appendix A for a full list of survey items).

There are a total of nine value items on the survey divided into three distinct value sets: Altruistic, egotistic, and Biospheric. The 9 items were adapted from Steg's et al. (2005) selection of self-enhancement values from a short version (Stern, Dietz, & Guagnano, 1998) of the universal value scale (Schwartz, 1992). Egotistic values reflect authority, wealth, and influential. Altruistic values are defined as social justice, equality, and helpfulness. Lastly, biospheric values are operationalized as preventing pollution, protecting the environment, and unity with nature. These items are measured on a scale from 0 (*not at all important*) to

6 (*of supreme importance*), with the addition of an option for respondents who disagree with the value.

Measurements of managerial support behaviors toward sustainable business practices will be defined using items from an adapted VBN theory test (Andersson et al., 2005). This test of the VBN theory is, to the best of the researcher's knowledge, the only test that has explained the "behaviors in organization" outcome, which is why Andersson's et al. (2005) behavioral scale items will be considered. Andersson et al. (2005) breaks the behavioral items into six categories, support for: environmental innovation, environmental competence building, environmental communication, environmental information dissemination, environmental rewards/recognition, and environmental management goals/responsibilities. Respondents were asked to indicate their agreement on a Likert-type scale ranging from 1 (*strongly agree*) to 5 (*strongly disagree*).

Personal norms, AR, and AC beliefs are measured in section three. The statements about personal norms and the two other beliefs were measured on a scale of 1 (*strongly agree*) to 5 (*strongly disagree*). The items concentrate on water use, energy consumption, and waste management, which will have a stronger relation to behaviors than general items about the environment (Steg et al., 2005). To control for a pro-environmental bias, Steg et al. (2005) suggests personal norm, AR, and AC belief items be administered after the support behaviors section.

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The fourth section of the survey is the New Ecological Paradigm scale (Dunlap et al., 2000). The NEP is a measure of ecological worldviews and is comprised of 15 items. The items have been designed by Dunlap et al. (2000) to reflect five components of an ecological worldview: reality of limits to growth, antianthropocentrism (a human-centered universe), fragility of nature's balance, rejection of exemptionalism (an idea that humans are immune to the constraints of nature), and possibility of an ecocrisis. For this study, five items from the original NEP scale will be used, measured on a five-point scale from strongly agree to strongly disagree (Stern et al., 1999). In order to elicit a measure of ecological worldview, items are worded so that agreement with the 2nd, 3rd, and 5th statements reveal a pro-ecological view and disagreement with the 1st and 4th statements reveal a pro-ecological view.

Demographic data are collected in order to better describe the data. In this survey section, the demographic questions will focus on the property's background and the manager's background.

Participants

The study participants were males and females with the title of manager (or equivalent). Manager demographics were self-reported from items on the survey. Questions regarding age, years of employment, responsibilities, education, awareness of environmental management, and job title will help categorize the hotel managers.

Description of Properties

Participating managers were employed at hotels, motels, and resorts in the Phoenix metropolitan area. Self-reported questions regarding property name, establishment, corporate structure, ownership, target markets, number of employees, capacity, and subjective growth will help to categorize the hotel properties.

Analysis procedures

Data analysis was conducted using Version 19 of the Statistical Package for the Social Sciences (SPSS), with data maintained on two password-protected SPSS spreadsheets (i.e., identification and data spreadsheets).

First, descriptive statistics were run to identify any anomalies or outliers within the demographic data or survey items. Frequency tables were created to help describe the participants and properties, including means and standard deviations where appropriate. Statistics were also run on each survey item and tables were created according to the VBN variables. The item tables include percentages of responses, means and standard deviations.

Second, Cronbach's alpha calculations were performed to test the reliability of the survey questions. Correlations were also run to identify any relationships between the different model variables.

Third, a series of regression analyses (Steg et al., 2005) were utilized to test the VBN theory's causal chain hypotheses and variable mediation hypotheses. The analyses consisted of multiple regressions that were used to make associations between variable. Often, multiple regression equations are created

and tested based on a researcher's hypotheses or statistical cues from the data. In the case of the VBN theory, a model exists to guide the regression analyses.

Ethical Considerations

The present research was approved for exempt status by the Arizona State University Office of Research Integrity and Assurance (see Appendix B). Although this study was non-experimental, there is an ethical consideration worth noting. This consideration was the protection and privacy of all study participants; this includes personal information, property information, and responses. The data retrieved from the surveys were entered into two password-protected spreadsheets, one for all identifying information (ID number, E-mail addresses, first name, last name, property name, job title), and the other for all data points and demographic information (ID number included). By separating responses from identifying information on password-protected spreadsheets, the safety of the participants' private information can be assured.

<div align="center">

Results

</div>

This chapter includes the findings of the survey analysis. First, the demographic analysis on the managers and the properties will be presented followed by descriptive statistics of the survey items. Next, a test of the VBN variables' reliability is reported along with variable correlations. Lastly, Tests of the VBN theory and mediating effects are reported (i.e. the six hypotheses) based on Steg's et al. (2005) analyses.

Managers

N=60. The participants' ages ranged from 24 to 56, with education levels ranging from high school/GED to master's degree (see Table 1). The length of employment as a manager ranged from less than 1 year to 22 years, and the six most common job titles were: general manager, front office/desk manager, operations manager, assistant general manager, sales manager, and guest services manager. Interestingly, 58.3% of managers were familiar with the term "environmental management" and a majority answered the open-ended question about what environmental management meant to them.

Table 1

Manager Background: Frequency and Percentage of Responses

Demographic Characteristics	N	%
Age		
20-29	15	25
30-39	25	41.7
40-49	11	18.3
50 and above	5	8.3
No Response	4	6.7
Education		
High School/GED	11	18.3
Technical/Associate's Degree	12	20
Bachelor's Degree	33	55

Master's Degree	4	6.7
Years of Employment (yrs.)		
0-5	36	60
6-10	14	23.3
11-15	4	6.7
16-20	2	3.3
21-25	2	3.3
No Response	2	3.3
EM Familiarity		
Yes	35	61.4
No	22	38.6

Properties

The properties participating in the study were identified as private ownerships (28.3%), chains (25%), franchises (28.3%), and management contracts (16.7%) by the managers (see Table 2). Out of all participating hotels, 45% had a AAA diamond rating of 3 and 23.3% were without a designation. The number of rooms and beds ranged from 52 to 1000 and 76 to 1500, respectively. Managers identified the number of employees as "less than 25" and "26-50" most frequently, accounting for 70% of the responses. Lastly, the most frequent target markets for these properties were identified as: Business (50.8%) domestic (20.3%), and leisure (18.6%).

Table 2

Property Background: Frequency and Percentage of Responses

Demographic Characteristics	N	%
Hotel Type		
Private Ownership	17	28.8
Chain	15	25.4
Franchise	17	28.8
Management Contract	10	16.9
Property Ownership		
United State	53	89.8
International	6	10.2
Primary Target Market		
Domestic	12	20.3
International	1	1.7
Leisure	11	18.6
Business	30	50.8
Group	3	5.1
Convention	2	3.4
AAA Diamond Rating		
2	8	13.3
3	27	45
4	9	15
5	2	3.3

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Does Not Apply	14	23.3
Number of Employees		
Less than 25	21	35
26-50	21	35
51-75	3	5
76-100	3	5
More than 101	12	20
Subjective Growth (past 5yrs)		
Very Good	17	28.3
Good	26	43.3
Average	14	23.3
Below Average	3	5

Survey Items

  Values. The value items were grouped into three categories (i.e., Egotistic, Altruistic, and Biospheric) per the VBN theory test (see Table 3). Percentages of responses were calculated showing that the majority answered between 4 and 5 (indicating that the values were important to the managers), with the exception of the "Material possessions, money" item (1B) (see Appendix A) which showed that 36.7% of the respondents answered between 0 and 3 (indicating that these values were not important or the manager's feelings about the value were neutral). Interestingly, a review of the category means showed that respondents believed

biospheric values were more important than altruistic and egotistic values,

respectively.

Table 3

Descriptive Statistics: Value Items

Item	0	1	2	3	4	5	6	dis	M	SD
Ego									4.36	0.67
1A	0	0	3.3	21.7	20	26.7	25	3.3	4.50	1.20
1B	1.7	6.7	10	18.3	43.3	13.3	6.7	0	3.62	1.32
1C	0	0	0	10	13.3	40	36.7	0	5.03	0.96
Alt									4.49	1.04
1D	3.3	0	0	18.3	26.7	36.7	13.3	1.7	4.32	1.25
1E	3.4	0	5.1	16.9	27.1	39	8.5	0	4.15	1.28
1F	1.7	0	5	6.7	8.3	26.7	51.7	0	5.07	1.33
Bio									4.71	1.09
1G	1.7	0	1.7	6.7	18.3	33.3	38.3	0	4.93	1.19
1H	1.7	0	3.3	10	18.3	31.7	33.3	1.7	4.76	1.28
1I	3.3	0	1.7	16.7	23.3	33.3	20	1.7	4.41	1.34

Note. Percentages of responses, means, and standard deviations are shown. Items correspond to the section (number) and question order (letter) of the survey instrument, for actual items see Appendix A. Category terms are paraphrased. Response ranges are as follows: 0 = Not at all important, 3 = Neutral, 6 = Of supreme importance, and dis = Disagree with value (table values for response range are percentages). The "disagree with value" responses were excluded from the mean calculations that determine the VBN variables. Items adapted from "Factors influencing the acceptability of energy policies: A test of the VBN theory," by L. Steg, L. Dreijerink, and W. Abrahamse, 2005, *Journal of Environmental Psychology, 25,* p. 418.

New ecological paradigm (NEP). The NEP items assessed respondents'

environmental outlook (see Table 4). For the VBN theory tests, items 4A and 4D

were reverse scored (see Appendix A).

Table 4

Descriptive Statistics: NEP Items

Item	1	2	3	4	5	M	SD
NEP						2.73	0.33
4A	18.3	40	23.3	16.7	1.7	2.43	1.03
4B	18.3	48.3	16.7	16.7	0	2.32	0.97
4C	13.3	46.7	26.7	13.3	0	2.40	0.89
4D	8.3	41.7	26.7	23.3	0	2.65	0.94
4E	26.7	53.3	11.7	8.3	0	2.02	0.85

Note. Percentages of responses, means, and standard deviations are shown. Items
correspond to the section (number) and question order (letter) of the survey
instrument, for actual items see Appendix A. Response ranges are as follows: 1 =
Strongly Agree, 2 = Agree, 3 = Neutral, 4 = Disagree, and 5 = Strongly Disagree,
(table values for response range are percentages). Items adapted from "A value-
belief-norm theory of support for social movements: The case of
environmentalism," by P. C. Stern, T. Dietz, T. Abel, G. A. Guagnano, and L.
Kalof, 1999, *Human Ecological Review, 6*(2), p. 95.

Awareness of consequences (AC). These items reflect the respondent's

awareness of the consequences with respect to water use, energy consumption,

and waste management (see Appendix A). A majority of respondents answered

between 1 and 2 (see Table 5); indicating that the sample was generally aware of

negative environmental consequences. Moreover, AC items pertaining to waste

issues had the largest percentages of responses between strongly agree and agree.

Table 5

Descriptive Statistics: AC Items

Item	1	2	3	4	5	M	SD
AC						1.84	0.52
3C	31.7	55	10	3.3	0	1.85	0.73
3G	35	55	10	0	0	1.75	0.63
3J	45	43.3	10	1.7	0	1.68	0.72
3K	41.7	45	8.3	5	0	1.77	0.81
3M	26.7	46.7	23.3	3.3	0	2.03	0.80
3T	33.3	40	23.3	3.3	0	1.97	0.84

Note. Percentages of responses, means, and standard deviations are shown. Items correspond to the section (number) and question order (letter) of the survey instrument, for actual items see Appendix A. Response ranges are as follows: 1 = Strongly Agree, 2 = Agree, 3 = Neutral, 4 = Disagree, and 5 = Strongly Disagree, (table values for response range are percentages). Items adapted from "Factors influencing the acceptability of energy policies: A test of the VBN theory," by L. Steg, L. Dreijerink, and W. Abrahamse, 2005, *Journal of Environmental Psychology, 25,* p. 419.

Ascription of responsibility (AR). AR items were also statements about water use, energy consumption, and waste management, however these items determine accountability for the environmental issues (see Table 6). Although a majority agreed with these statements, percentages of responses for these items were more spread out along the response range.

Table 6

Descriptive Statistics: AR Items

Item	1	2	3	4	5	M	SD
AR						2.84	0.40
3O	11.7	43.3	31.7	11.7	1.7	2.48	0.91
3Q	8.3	46.7	30	13.3	1.7	2.53	0.89
3S	5	11.7	15	43.3	25	3.71	1.12
3D	26.7	56.7	5	11.7	0	2.02	0.89
3E	3.3	21.7	41.7	30	3.3	3.08	0.89
3A	5	18.3	33.3	41.7	1.7	3.17	0.92

Note. Percentages of responses, means, and standard deviations are shown. Items correspond to the section (number) and question order (letter) of the survey instrument, for actual items see Appendix A. Response ranges are as follows: 1 = Strongly Agree, 2 = Agree, 3 = Neutral, 4 = Disagree, and 5 = Strongly Disagree, (table values for response range are percentages). Items adapted from "Factors influencing the acceptability of energy policies: A test of the VBN theory," by L. Steg, L. Dreijerink, and W. Abrahamse, 2005, *Journal of Environmental Psychology, 25,* p. 419.

Personal norms (PN). Personal norm items, like AC and AR items, were written in terms of the three previously discussed environmental issues. These items were also rated as strongly agree or agree by a majority of the respondents (see Table 7). Surprisingly, 11.7% of respondents disagreed with the "I feel personally obligated to save as much energy and water as possible" item (3F) (see Appendix A), and 8.3% strongly disagreed with the "I feel guilty when I throw out uneaten food" item (3R).

Table 7

Descriptive Statistics: PN Items

Item	1	2	3	4	5	M	SD
PN						2.07	0.68
3N	25	48.3	21.7	3.3	1.7	2.08	0.87
3B	21.7	55	15	8.3	0	2.10	0.84
3F	23.3	50	15	11.7	0	2.15	0.92
3L	21.7	33.3	36.7	8.3	0	2.32	0.91
3H	31.7	46.7	15	6.7	0	1.97	0.86
3I	33.	45	16.7	5	0	1.93	0.84
3R	26.7	45	15	5	8.3	2.23	1.16
3P	41.7	43.3	8.3	6.7	0	1.80	0.86

Note. Percentages of responses, means and, standard deviations are shown. Items correspond to the section (number) and question order (letter) of the survey instrument, for actual items see Appendix A. Response ranges are as follows: 1 = Strongly Agree, 2 = Agree, 3 = Neutral, 4 = Disagree, and 5 = Strongly Disagree, (table values for response range are percentages). Items adapted from "Factors influencing the acceptability of energy policies: A test of the VBN theory," by L. Steg, L. Dreijerink, and W. Abrahamse, 2005, *Journal of Environmental Psychology, 25,* p. 419.

Behaviors. These items pertained to positive environmental management support behaviors (see Table 8). There was a wide distribution of responses for these items. Although the ratings seem to cluster towards the agreement end of the scale, a noticeable portion of responses was neutral. Interestingly, the statement "If an employee does not properly implement environmental policies and/or

practices, I reprimand the employee" (2N) (see Appendix A) was rated as

disagree and strongly disagree by 38.3% and 18.3% of respondents, respectively.

Table 8

Descriptive Statistics: Behavior Items

Item	1	2	3	4	5	M	SD
Behaviors						2.53	0.60
2A	11.7	46.7	30	11.7	0	2.42	0.85
2B	26.7	51.7	16.7	5	0	2.00	0.80
2C	28.3	58.3	10	3.3	0	1.88	0.72
2D	11.7	31.7	43.3	10	3.3	2.62	0.94
2E	26.7	43.3	26.7	3.3	0	2.07	0.82
2F	8.5	30.5	33.9	22	5.1	2.85	1.03
2G	16.7	48.3	30	5	0	2.23	0.79
2H	15	55	21.7	8.3	0	2.23	0.81
2I	8.5	44.1	33.9	13.6	0	2.53	0.84
2J	15	23.3	30	25	6.7	2.85	1.16
2K	16.7	31.7	38.3	11.7	1.7	2.50	0.97
2L	13.3	48.3	33.3	5	0	2.30	0.77
2M	5.1	16.9	33.9	32.2	11.9	3.29	1.05
2N	6.7	11.7	25	38.3	18.3	3.50	1.13
2O	11.7	55	28.3	1.7	3.3	2.30	0.83
2P	5	36.7	36.7	18.3	3.3	2.78	0.92
2Q	13.3	56.7	25	3.3	1.7	2.23	0.79

2R		6.7	26.7	40	20	6.7	2.93	1.01

Note. Percentages of responses, means, and standard deviations are shown. Items correspond to the section (number) and question order (letter) of the survey instrument, for actual items see Appendix A. Response ranges are as follows: 1 = Strongly Agree, 2 = Agree, 3 = Neutral, 4 = Disagree, and 5 = Strongly Disagree, (table values for response range are percentages). Items adapted from "The role of supervisory support behaviors and environmental policy in employee 'ecoinitiatives' at leading-edge European companies," by C. A. Ramus and U. Steger, 2000, *Academy of Management Journal, 43*(4), p. 614.

Scale Reliability

Cronbach's alpha was used as a measure of reliability for the VBN theory items (see Table 9). The egotistic value orientation and ascription of responsibility demonstrated poor reliability.

Table 9

Cronbach's Alpha Coefficients of Reliability

Variable	Cronbach's Alpha
EGO	.013
ALT	.723
BIO	.821
NEP	.830
AC	.780
AR	.058
PN	.884
EMSB	.919

Note. EMSB = environmental management support behaviors. The first (4A) and fourth (4D) items (see Appendix A) of the NEP variable were reverse scored before the Cronbach's alpha statistic was calculated.

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Correlations

A correlation was run on the averages of each variable to be used in the VBN theory test (i.e., egotistic values, altruistic values, biospheric values, NEP, AC, AR, PN, and behaviors) (see Table 10). Although egotistic values were not correlated with any VBN variables, significant correlations were observed at alpha level .05 or smaller between most of the VBN variables.

Table 10

Correlations of the VBN Theory Variables

Variable	EGO	ALT	BIO	NEP	AC	AR	PN
EGO	1						
ALT	0.099	1					
BIO	-0.103	**.568****	1				
NEP	0.201	**-.403****	**-.444****	1			
AC	0.019	**-.541****	**-.367****	**.532****	1		
AR	-0.148	**-.395****	-0.044	0.121	**.412****	1	
PN	0.133	**-.549****	**-.487****	**.568****	**.641****	**.350****	1
EMSB	0.011	**-.336***	**-.293***	**.312***	**.341****	0.167	**.534****

Note. EMSB = environmental management support behaviors; Bold values = significant. Correlations with * indicates significance at the 0.05 alpha level (2-tailed). Correlations with ** indicates significance at the 0.01 alpha level (2-tailed).

VBN Theory Tests

To Test the first two hypotheses (see *Methodology*), a series of nine regression analyses were run in accordance with Steg's et al. (2005) analysis (see Table 11). This method satisfies both hypotheses because each causal chain variable is regressed on the preceding variable in model 1, while further variables down the causal chain are regressed in model 2 (Steg et al., 2005). See Figure 2 for significant VBN theory connections.

Table 11

Multiple Regressions to Test the VBN Causal Chain

	β	95% ci	t	p	Adj. R^2	F	df	p	f^2
DV: EMSB Model 1:					.28	21.59	1, 52	.000	.39
PN	.48	.27, .68	4.65	.000					
Model 2:					.19	2.79	6, 46	.017	.23
PN	.46	.13, .80	2.79	.008					
AR	-.04	-.48, .39	-.20	.839					
AC	-.02	-.42, .38	-.12	.903					
NEP	-.00	-.27, .26	-.03	.978					
EGO	.00	-.24, .24	.01	.993					
ALT	-.05	-.26, .15	-.53	.599					
BIO	.01	-.17, .19	.11	.913					
DV: PN									

	B	95% CI	t	p	R^2	F	df	p	f^2
Model 1:					.11	7.98	1, 54	.007	.12
AR	.61	.18, 1.04	2.83	.007					
Model 2:					.51	10.62	5, 49	.000	1.04
AR	.26	-.12, .63	1.38	.173					
AC	.40	.08, .73	2.50	.016					
NEP	.23	.01, .45	2.09	.042					
EGO	.09	-.11, .29	.90	.375					
ALT	-.09	-.27, .08	-1.05	.301					
BIO	-.08	-.24, .07	-1.12	.269					
DV: AR									
Model 1:					.14	9.72	1, 54	.003	.16
AC	.29	.10, .48	3.11	.003					
Model 2:					.19	3.61	4, 50	.007	.23
AC	.23	-.01, .47	1.94	.058					
NEP	-.03	-.20, .14	-.39	.701					
EGO	-.05	-.20, .10	-.68	.502					
ALT	-.14	-.27, -.02	-2.28	.027					
BIO	.09	-.02, .20	1.60	.116					
DV: AC									
Model 1:					.29	22.90	1, 54	.000	.41
NEP	.39	.23, .56	4.79	.000					
Model 2:					.38	9.26	3, 51	.000	.61
NEP	.29	.11, .47	3.27	.002					

	β	95% ci	t	p					
EGO	-.02	-.20, .16	-.20	.845					
ALT	-.20	-.34, -.06	-2.90	.005					
BIO	.02	-.11, .15	.32	.751					
DV: NEP					.23	6.59	3, 52	.001	.30
EGO	.22	-.05, .49	1.67	.101					
ALT	-.19	-.40, .02	-1.85	.071					
BIO	-.19	-.39, .01	-1.90	.063					

Note. DV = dependent variable; EMSB = environmental management support behaviors; 95% ci = confidence interval around β. If the confidence internal excludes zero, the β is considered to be statistically significant. f^2 = population effect size index for multiple correlation. For multiple correlations, f^2 of .35 is considered to be large, and f^2 of .15 is considered to be medium. EMSB = environmental management support behaviors. Adapted from "Factors influencing the acceptability of energy policies: A test of the VBN theory," by L. Steg, L. Dreijerink, and W. Abrahamse, 2005, *Journal of Environmental Psychology, 25,* p. 421.

Person norms explained 28% of the variance in environmental management support behaviors (effect size f^2 = .39). When all variables were regressed according to the VBN causal chain, 19% of the variance in environmental management support behaviors was explained (f^2 = .23). The only significant contributor to this model was personal norms implying that the stronger a manager's personal norms about water, energy, and waste, the more likely they are to support environmental management practices (β = .46, p = .008). The 95% confidence interval for this population does not include a zero (95% ci: .13, .80); furthering the conclusion that personal norm is statistically significant.

Ascription of responsibility beliefs explained 11% of the variance in personal norms ($f^2 = .12$). When all preceding variables were regressed along with AR, 51% of the variance in personal norms was explained accompanied by an unusually high effect size ($f^2 = 1.04$). AR beliefs were not significant in this model ($\beta = .26$, $p = .173$). The significant contributors to this model were AC ($\beta = .40$, $p = .016$) and NEP ($\beta = .23$, $p = .042$) beliefs, implying that managers who have stronger AC and NEP beliefs tend to have a stronger sense of obligation to act in a pro-environmental manner. The 95% confidence intervals for AC (95% ci: .08, .73) and NEP (95% ci: .01, .45) further the conclusion that AC and NEP beliefs significantly contribute to the explanation of personal norms.

Awareness of consequences beliefs explained 14% of the variance in AR beliefs ($f^2 = .16$). The addition of the preceding variables explained 19% of the variance in AR Beliefs ($f^2 = .23$). AC beliefs were not considered significant in this model according to the .05 alpha level used in this study ($\beta = .23$, $p = .058$). Altruistic value orientation was the only significant contributor to this model ($\beta = -.14$ $p = .027$). The negative coefficient implies that the weaker a manager's altruistic value orientation, the more likely they are to have stronger beliefs about their ascription of responsibility. The 95% confidence interval for ALT (95% ci: -.27, -.02) furthers the conclusion that altruistic value orientation significantly contributes to the explanation of AR beliefs.

The new ecological paradigm perspective explained 29% of the variance in AC beliefs ($f^2 = .41$). When the preceding variables were included in the regression, 38% of the variance in AC beliefs was explained ($f^2 = .61$). The NEP

($\beta = .29$, $p = .002$) and altruistic value orientation ($\beta = -.20$ $p = .005$) were the only significant contributors to this model, implying that managers with a weak altruistic value orientation and a strong NEP perspective tend to be more aware of the consequences of water use, energy consumption, and waste production. The 95% confidence intervals for the NEP (95% ci: .11, .47) and altruistic value orientation (95% ci: -.34, -.06) further the conclusion that NEP beliefs and altruistic value orientation significantly contribute to the explanation of AC beliefs.

Egotistic, altruistic, and biospheric value orientations explained 23% of the variance in the NEP perspective ($f^2 = .30$). None of the value orientations significantly contributed to the model individually, implying that managers with aspects of all three value orientations tend to have a stronger NEP perspective.
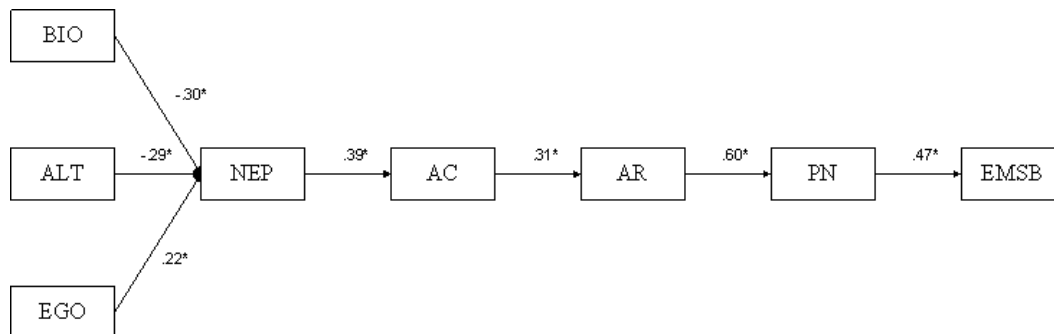
Figure 2. Individual connection coefficients of the VBN theory. Significant relationships are represented by *.

Mediating Variables within the VBN Theory

VBN variables were analyzed for mediating effects according to Steg's et al. (2005) four additional VBN hypotheses. In order to test the mediating hypotheses the analysis must account for three conditions, "First, the independent

variable must affect the mediator…second, the independent variable must be
shown to affect the dependent variable…and third, the mediator must affect the
dependent variable…" (Baron & Kenny, 1986, p. 1177). To test for significance,
regression equations were analyzed according to recommendations by Baron &
Kenny (1986) (see Table 12). Statistics from individual regressions on each
mediation connection (i.e., unstandardized Betas and standard errors) were
entered into an equation for testing mediation significance (Sobel, 1982 *as cited
in* Baron & Kenny, 1986). The outcome statistic was then compared against the
appropriate critical value. In the following paragraphs, the results of each
hypothesis test are explained.

Table 12

Single & Multiple Regressions to Test Mediation Effects

	β	95% ci	t	p	Adj. R^2	F	df	p	f^2
H3:									
DV: PN					.11	8.12	1, 58	.006	.12
AR	.60	.18, 1.02	2.85	.006					
DV: EMSB					.01	1.61	1, 56	.209	.01
AR	.25	-.01, .64	1.27	.209					
DV: EMSB					.26	11.04	2, 55	.000	.35
AR	-.06	-.42, .31	-.31	.757					
PN	.48	.26, .69	4.46	.000					

	B	95% CI	t	p	R^2	F	df	p	f^2
H4:									
DV: AR					.16	11.88	1, 58	.001	.19
AC	.31	.13, .49	3.45	.001					
DV: PN					.40	40.51	1, 58	.000	.67
AC	.83	.57, 1.09	6.37	.000					
DV: PN					.40	20.65	2, 57	.000	.67
AC	.77	.49, 1.06	5.41	.000					
AR	.18	-.20, .56	.94	.354					
H5:									
DV: AC					.27	22.95	1, 58	.000	.37
NEP	.39	.23, .55	4.79	.000					
DV: AR					-.00	.86	1, 58	.358	-.00
NEP	.07	-.08, .21	.93	.358					
DV: AR					.16	6.41	2, 57	.003	.19
NEP	-.08	-.23, .08	-.98	.334					
AC	.37	.15, .58	3.44	.001					
H6:									
DV: NEP					.23	6.59	3, 52	.001	.30
EGO	.22	-.05, .49	1.67	.101					
ALT	-.19	-.40, .02	-1.85	.071					
BIO	-.19	-.39, .01	-1.90	.063					

	β	95% ci	t	p	R^2	F	df	p	f^2
DV: AC					.26	7.40	3, 52	.000	.35
EGO	.05	-.14, .24	.51	.613					
ALT	-.26	-.40, -.11	-3.52	.001					
BIO	-.03	-.17, .11	-.49	.629					
DV: AC					.38	9.26	4, 51	.000	.61
EGO	-.02	-.20, .16	-.20	.845					
ALT	-.20	-.34, -.06	-2.90	.005					
BIO	.02	-.11, .15	.32	.751					
NEP	.29	.11, .47	3.27	.002					

Note. DV = dependent variable; EMSB = environmental management support behaviors; 95% ci = confidence interval around β. If the confidence internal excludes zero, the β is considered to be statistically significant. f^2 = population effect size index for multiple correlation. For multiple correlations, f^2 of .35 is considered to be large, and f^2 of .15 is considered to be medium. EMSB = environmental management support behaviors. Adapted from "Factors influencing the acceptability of energy policies: A test of the VBN theory," by L. Steg, L. Dreijerink, and W. Abrahamse, 2005, *Journal of Environmental Psychology, 25,* p. 421.

Hypothesis 3. The relationship between AR beliefs and environmental management support behaviors was mediated by personal norms: $t = 2.433$, $p = .014$. The regression of PN on AR was significant: $F(1,58) = 8.12$, $p = .006$. The regression of behaviors on AR, however, was not significant: $F(1, 56) = 1.61$, $p = ns$. Finally, in the regression of behaviors on AR and PN ($F(2, 55) = 11.04$, $p < .000$), only PN ($\beta = .48$, $p < .000$, 95% ci: .26, .69) significantly contributed to the regression model, while AR did not have a significant unique relationship with

environmental management support behaviors when PN was controlled for (β = -.06, p = .757, 95% ci: -.42, .31), pointing to a mediating role of PN.

Hypothesis 4. The relationship between AC and PN was mediated by AR: t = 2.195, p = .028. The regression of AR on AC was significant: $F(1, 58)$ = 11.88, p = .001. Moreover, the regression of PN on AC was significant: $F(1, 58)$ = 40.51, p < .000. Finally, in the regression of PN on AC and AR ($F(2, 57)$ = 20.65, p < .000), AR did not (β = .18, p = .354, 95% ci: -.20, .56) significantly contributed to the regression model, while AC did have a significant unique relationship with PN when AR was controlled for (Beta = .77, p < .000, 95% ci: .49, 1.06), pointing to a mediating role of AR.

Hypothesis 5. The relationship between NEP and AR was mediated by AC: t = 2.797, p = .005. The regression of AC on NEP was significant: $F(1, 58)$ = 22.95, p < .000. Moreover, the regression of AR on NEP was not significant: $F(1, 58)$ = .86, p = .358. Finally, in the regression of AR on NEP and AC ($F(2, 57)$ = 6.41, p = .003), only AC (β = .37, p = .001, 95% ci: .15, .58) significantly contributed to the regression model, while NEP did not have a significant unique relationship with AR when AC was controlled for (β = -.08, p = ns, 95% ci: -.23, .08), which points to a mediating role of AC.

Hypothesis 6. Lastly, the mediating relationship of NEP between values and AC was examined using three mediation test statistics for each of the value orientations. It was shown that NEP mediated the relationship between altruistic values and AC (t = -2.699, p = .006) and biospheric values and AC (t = -2.951, p = .003); the relationship between egotistic values and AC, however, was not

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mediated by NEP ($t = 1.451$, $p = .146$). Additionally, the regression of NEP on values was significant: $F(3, 52) = 6.59$, $p = .001$. Moreover, the regression of AC on values was significant: $F(3, 52) = 7.40$, $p < .000$. Finally, in the regression of AC on values and NEP ($F(4, 51) = 9.26$, $p < .000$), NEP (Beta = .29, $p = .002$, 95% ci: .11, .47) and altruistic value orientation ($\beta = -.20$, $p = .005$, 95% ci: -.34, -.06) significantly contributed to the regression model, while egotistic (Beta = -.02, $p = ns$, 95% ci: -.20, .16) and biospheric value ($\beta = .02$, $p = ns$, 95% ci: -.11, .15) orientations did not have a significant unique relationship with AC when NEP was controlled for, pointing to a slight mediating role of NEP.

Discussion

VBN Theory

Results of this study indicate that the VBN theory was successful in explaining environmental management support behaviors in the accommodations sector of the tourism industry. The results showed significant relationships between each variable in the VBN theory. In line with past VBN theory tests (Nordlund & Garvill, 2003; Steg et al., 2005), personal norms were the largest significant contributors (28% of the variance explained) to support behaviors. Enigmatically, when all variables were entered into the regression equation, with behaviors as the dependent variable, 19% of the variance was explained; as more variables are added into a regression equation, the amount of explained variance usually increases. This may be due to latent interactions between variables that resulted in a dilution of the variance. Although regression analysis does not allow for the conclusion of cause-and-effect, the positive relationship between personal

norms and environmental management support behaviors reinforces the importance of a manager's strong moral obligation to act in a pro-environmental manner when considering environmental management systems in the accommodations sector.

The results also showed that 51% of the variance could be explained in personal norms when other variables were entered into the regression model, in addition to AR. This is congruent with Steg's et al. (2005) findings, however the explained variance was slightly higher in the present study and the significant contributors to the model were AC and NEP rather than biospheric values. Although a significant amount of variance in support behaviors was explained by personal norms, the addition of the preceding variables decreased the explanatory power in this model. In the remaining models, however, the explanatory power of the variables increased when the preceding variable were entered into the regression model. The results of the VBN theory test confirm the ordering of the causal chain's variables: from fairly stable values to human-environment interaction beliefs that are related to beliefs about awareness of and ascription of responsibility to reduce environmental threats, in turn, these beliefs are related to a moral obligation to act which are also related to environmental management support behaviors. In the following sections, mediating hypotheses and study limitations are discussed

VBN Mediation

Mediation hypotheses were tested to reinforce the results of the VBN theory test. For the first mediating hypothesis (hypothesis 3), personal norms were

shown to be significant mediators between AR beliefs and behaviors. Although the conditions laid out by Baron & Kenny (1986) were not all met (i.e., condition 2), the Sobel test statistic was significant which lead to a confirmation of the mediation effect.

The results of the Sobel t test were also shown to confirm the mediating relationships in hypotheses 4 and 5; similar to hypothesis 3, however, not all mediating conditions were met. One potential reason why these hypotheses lacked certain mediation conditions would be the use of AR beliefs in the mediation analysis. AR belief items were shown to be unreliable which may have contributed to the irregular mediation tests.

Hypothesis 6 was also lacking in the appropriate mediating conditions. In addition to an insignificant Sobel test for the mediating relationship of NEP between egotistic values and AC beliefs, the results suggested only a slight mediating effect of NEP. Again, this weak mediation effect could be attributed to the unreliability of egotistic value items.

Limitations

Using the VBN theory to predict environmental behaviors in organizations is more difficult to test than predictions of individualized behavior due to occupational variables that are out of an employee's control; for example, time restrictions, budgeting issues, and policies that restrict the amount of information that employees can provide, including the manner in which employees answer survey questions.

With respect to survey responses, another limitation of this study was item reliability and missing data. The lack of reliability in egotistic value orientations and ascription of responsibility items could be attributed to alterations of the original items to reflect specific environmental issues and to fit the survey time frame. With respect to the egotistic value orientation, another explanation could be a social desirability issue; some hotel managers may not have wanted to portray themselves as one egotistic item suggested (i.e., materialistic), which could have resulted in a response out of sync with the other two items that make up the egotistic value orientation variable. Another possible contributor to the low reliability of the ascription of responsibility items could be the lack of actual responsibility in a manager's job description to improve environmental issues. In other words, a manager may have strong pro-environmental values and beliefs, however they may not feel they are responsible for reversing negative environmental impacts because they are not being paid to do so. Although egotistic value orientation and ascription of responsibility items were unreliable, the variables were maintained in the analysis for transparency within the results. In addition, a majority of the missing data was attributed to the use of electronic surveys. Managers that were asked to fill out an electronic copy had the freedom to skip questions, which resulted in identification issues.

Although the data suggest the VBN theory has explanatory power in this study, small sample size was also a limitation of this study. Data was collected by one researcher, which may have attributed to the small sample size. Although the collection process lasted 6 weeks, time of day and driving time between

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properties seemed to be major contributors to the small sample. Managers were usually in meetings during the morning hours that left only the hours between noon and 4:00pm for data collection each day.

Conclusion

The significant relations observed between the VBN causal chain variables leads to the conclusion that this theory is an acceptable predictor of environmental management support behaviors. The implications of this study's results extend to: companies considering the implementation of environmental management systems and researchers investigating the use of theory in corporate environmental efforts. In regard to the former, these results suggest the VBN theory may be useful in the review process of an environmental management system as a measure of employee's willingness to support the system over time. This theory may also be useful as a training and screening tool for new employees; by having potential employees respond to the survey items used in this study, companies will be able to clarify their role in supporting an environmental management system.

With respect to researchers, the present study has shown one example of how theory could be used to explain behaviors within organizations. The ability of researchers to accurately test the VBN theory within other organizations is paramount in the pursuit of a theoretical explanation of environmental management support behaviors. To encourage further theoretical investigations in the environmental management literature, the following will focus on

recommendations for testing the VBN theory in the hotel industry and other organizations.

The current structure of the theory is sufficient in explaining environmental management support behaviors in the hotel industry even though research has suggested organizational behaviors are not fully dictated by personal values, beliefs, and norms (Andersson et al., 2005; Stern, 2000). A motion to remove the organizational behaviors outcome from the VBN theory is not necessary, however results from the present study suggest that the addition of variables may help explain more of the variance in organizational behaviors. Andersson's et al. (2005) attempt to introduce organization-specific variables into the VBN causal chain resulted in a significant contribution of "perceived corporate commitment to sustainability" (p. 302). There are certain observations in the current study that suggest the need for additional causal chain variables similar to Andersson's et al. (2005) model. The results showed that ascription of responsibility belief items were not a reliable measure with respect to organizational behaviors. Thus, the researcher proposes the addition of items that represent a "job description" variable. This variable should consider environmental responsibilities dictated by occupation, company policies, and customer pressures. In addition to AR beliefs, the results showed that the egotistic value items were not reliable measures; to remedy this, a variable that measures the importance of customer satisfaction in an organization 's values may be useful in controlling for socially desirable and appeasement responses. Future researchers should attempt to test variables similar to the ones discussed above; if

a replicated test variable was able to consistently show a relationship to each VBN variable that follows, then the introduction of the test variable into the causal chain should be considered in order to improve explanatory power in the domain of organization behaviors.

An important consideration for future researchers of hotel and resort properties is to be sure to document each respondent's job title and type of hotel (i.e. corporate structure and size). An analysis of these variables could prove valuable for predicting which type of manager and property would be more likely to support an environmental management system.

In addition to the above recommendations, researchers testing the VBN theory within other hospitality-focused organizations should try to control for responses that are socially desirable. Employees are often very aware and focused on customer satisfaction, which may influence survey responses. One suggestion is to emphasize the importance of responding truthfully and with respect to personal views. Another suggestion is to rephrase items to evoke more personal answers rather than desirable responses.

Face to face interactions between researcher and manager was shown to have a positive effect on the response rate and should be a consideration in future research. Although this technique is more expensive (i.e., fuel costs), the interaction provides responses in a timely manner and it affords an opportunity to share perspectives that may be beneficial to both parties.

Future researchers should also explore alternative data collection procedures that are efficient and yield higher sample sizes. In this study,

electronic surveys were replaced with paper copies due to a low response rate with the former technique. Although the use of paper copies yielded a higher response rate, the amount of paper used to print the surveys was not environmentally sustainable. One alternative is the use of a tablet computer to fill out surveys. With this technique, subjects would be able to take "on-site" surveys while drastically reducing the consumption of paper. A research team is also recommended when investigating accommodations managers in a destination city. The quantity and geography of this population resulted in a small sample size that could have been larger with the help of research assistants to distribute and collect surveys.

The lack of research on the VBN theory's "behaviors in organizations" outcome is understandable when sampling barriers are considered, such as: time constraints of employees, the length of the survey needed to test the VBN variables, and missing data due to privileged information. It is the hope of this researcher that the VBN test presented here will be a guide for future investigations of corporate personnel and environmental support behaviors.

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APPENDIX A

SURVEY INSTRUMENT

Greetings,

I am a graduate student under the direction of Professor Dave White in the School of Community Resources & Development at Arizona State University. I am conducting a research study to understand the decision-making processes of hotel and resort managers with regard to environmental practices.

I invite you to participate in a survey of hotel managers, which will involve completing a questionnaire that will take less than 10 minutes. Please answer the following questions based on your own opinions and attitudes rather than as a representative of your organization. You may notice that some questions seem similar, but please understand that every question is unique and important to the study. You may skip any question or stop the questionnaire at any time. Your participation in this study is voluntary. If you choose not to participate or withdraw from the study at any time, there will be no penalty and your responses will be kept strictly confidential. Data will be maintained on a password-protected secure server and no personally-identifying information will be connected to your responses. The results of this study may appear in reports, presentations, or publications but your name will not be used.

While there will be no direct benefit to you upon completion, the survey results will be used to improve environmental management practices in the hotel industry. As a participant, you will receive a copy of the study results.

If you have any questions concerning the research study, please contact the research team: Simon Rubin (simon.rubin@asu.edu) or Professor Dave White (dave.white@asu.edu). If you have any questions about your rights as a subject/participant in this research, or if you feel you have been placed at risk, you can contact the Chair of the Human Subjects Institutional Review Board, through the ASU Office of Research Integrity and Assurance, at (480) 965-6788.

Sincerely,

Simon Rubin

1. Please rate the importance of these nine values as a guiding principle in your life.

	Not at all important (0)	1	2	Neutral (3)	4	5	Of supreme importance (6)	DISAGREE WITH VALUE
a) The right to lead or command.	○	○	○	○	○	○	○	○
b) Material possessions, money.	○	○	○	○	○	○	○	○
c) Having an impact on people and events.	○	○	○	○	○	○	○	○
d) Correcting injustice, caring for the weak.	○	○	○	○	○	○	○	○
e) Working for the welfare of others.	○	○	○	○	○	○	○	○
f) Equal opportunity for all.	○	○	○	○	○	○	○	○
g) Preserving nature.	○	○	○	○	○	○	○	○
h) Preventing pollution.	○	○	○	○	○	○	○	○
i) Fitting into nature.	○	○	○	○	○	○	○	○

2. Please rate the extent to which you agree or disagree with the following statements.

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
a) I experiment with new environmentally friendly ideas in order to examine whether they are profitable/feasible to adopt on a large scale.	○	○	○	○	○
b) I encourage partnerships with other departments in order to implement new environmentally friendly ideas.	○	○	○	○	○
c) I encourage new environmentally friendly ideas from employees.	○	○	○	○	○
d) I spend time discussing and implementing a learning plan with each employee for new environmentally friendly practices.	○	○	○	○	○
e) I encourage employee participation in environmentally friendly training and education.	○	○	○	○	○
f) I realign employee responsibilities to allow employees time for environmental training, site visits, or exploring new sustainability techniques.	○	○	○	○	○
g) I encourage employee communication about environmental issues.	○	○	○	○	○
h) I create an open environment in which to discuss sustainability decisions that affect the business. For example, welcoming employee discussions about the implementation of new environmental policies.	○	○	○	○	○
i) I embrace difficult discussions about environmental issues and problems.	○	○	○	○	○
j) I am often the first to know about changes in the company's environmental policy.	○	○	○	○	○
k) I actively aid the flow of information about environmental issues to employees.	○	○	○	○	○
l) I clearly explain the reason for the company's environmental goals and/or policies, and forewarn employees about expected changes whenever possible.	○	○	○	○	○
m) I use an award system to recognize employee achievements concerning environmental issues.	○	○	○	○	○
n) If an employee does not properly implement environmental policies and/or practices, I reprimand the employee.	○	○	○	○	○
o) I recognize positive employee contributions to environmental issues that affect the company.	○	○	○	○	○
p) I delegate pro-environmental tasks to employees and tell them precisely how the task should be performed.	○	○	○	○	○
q) I encourage employees to take responsibility for environmental issues.	○	○	○	○	○
r) I always talk to employees about environmental goals and responsibilities regardless of requirements by the company's policies.	○	○	○	○	○

3. Please rate the extent to which you agree or disagree with the following statements.

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
a) My contribution to waste issues is negligible.	○	○	○	○	○
b) I would be a better person if I saved resources like energy and water.	○	○	○	○	○
c) Energy saving helps reduce greenhouse gasses in the air.	○	○	○	○	○
d) Not only are governments and industry responsible for high energy and water consumption levels, but I am too.	○	○	○	○	○
e) My contribution to energy problems is negligible.	○	○	○	○	○
f) I feel personally obligated to save as much energy and water as possible.	○	○	○	○	○
g) Environmental quality will improve if we manage waste more efficiently.	○	○	○	○	○
h) People like me should do everything they can to reduce waste.	○	○	○	○	○
i) I feel morally obligated to save energy and water, regardless of what others do.	○	○	○	○	○
j) Managing waste is a problem for society.	○	○	○	○	○
k) The exhaustion of water sources is a problem.	○	○	○	○	○
l) I feel obligated to bear the environment and nature in mind in my daily behavior.	○	○	○	○	○
m) Fresh water sources are becoming harder to find.	○	○	○	○	○
n) I feel guilty when I waste water and energy.	○	○	○	○	○
o) I feel jointly responsible for the exhaustion of energy sources.	○	○	○	○	○
p) If I were to buy a new appliance, I would feel morally obligated to buy an energy efficient one.	○	○	○	○	○
q) I feel jointly responsible for the exhaustion of water sources.	○	○	○	○	○
r) I feel guilty when I throw out uneaten food.	○	○	○	○	○
s) In principle, individuals on their own cannot contribute to the reduction of energy, waste or water problems.	○	○	○	○	○
t) The exhaustion of fossil fuels is a problem.	○	○	○	○	○

4. Listed below are statements about the relationship between humans and the environment. For each one, please rate the extend to which you agree or disagree.

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
a) The so-called "ecological crisis" facing humankind has been greatly exaggerated.	○	○	○	○	○
b) The earth is like a spaceship with very limited room and resources.	○	○	○	○	○
c) If things continue on their present course, we will soon experience a major ecological catastrophe.	○	○	○	○	○
d) The balance of nature is strong enough to cope with the impacts of modern industrial nations.	○	○	○	○	○
e) Humans are severely abusing the environment.	○	○	○	○	○

Demographics (Hotel)

5. What is the name of the hotel/resort?

6. Year of Establishment (YYYY)

7. Please indicate which type of hotel best describes your property.

- ○ Private Ownership
- ○ Chain
- ○ Franchise
- ○ Management Contract

8. Property Ownership

- ○ United States
- ○ International

If you checked International, which country?

9. Please indicate the primary target market of your property

- ○ Domestic
- ○ International
- ○ Leisure
- ○ Business
- ○ Family
- ○ Group
- ○ Independent travelers
- ○ Convention

10. Hotel Size

Number of Rooms

Number of Beds

11. Diamond Rating (AAA)

- ○ 1
- ○ 2
- ○ 3
- ○ 4
- ○ 5
- ○ Does Not Apply

12. Please indicate the number of employees at this property

- ○ Less than 25
- ○ 26-50
- ○ 51-75
- ○ 76-100
- ○ More than 101

13. According to your personal assessment, please indicate the growth of the property in the last 5 years compared to the industry average.

- ○ Very Good
- ○ Good
- ○ Average
- ○ Below Average

Demographics (Employee)

14. What is your job title?

15. How long have you been an employee of the hotel (in years)

16. What are your responsibilities within the hotel?
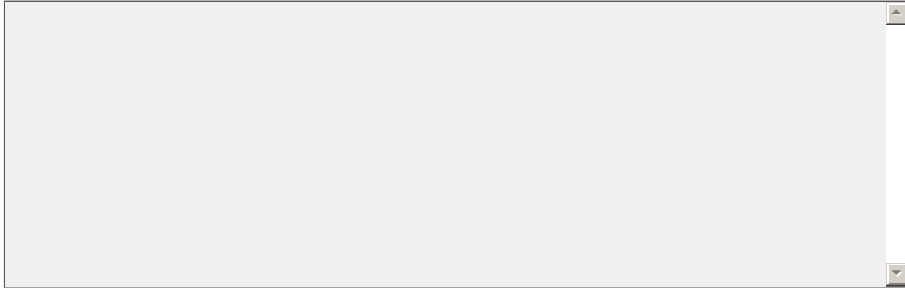
17. Age

18. Please indicate the highest level of education that you have attained

- ○ Less than high school
- ○ High school diploma/GED
- ○ Technical school or associate degree
- ○ Bachelor's degree
- ○ Master's degree
- ○ Ph.D., M.D., D.O., J.D., or equivalent

19. Are you familiar with the term "environmental management"?

○ Yes

○ No

If 'Yes', what does the term mean to you?

APPENDIX B

RESEARCH EXEMPT STATUS APPROVAL

ASU Knowledge Enterprise Development

Office of Research Integrity and Assurance

To:	Dave White UCENT
From:	Mark Roosa, Chair Soc Beh IRB
Date:	06/07/2011
Committee Action:	**Exemption Granted**
IRB Action Date:	06/07/2011
IRB Protocol #:	1105006446
Study Title:	Antecedents of Effective Environmental Management in a Hotel Setting

The above-referenced protocol is considered exempt after review by the Institutional Review Board pursuant to Federal regulations, 45 CFR Part 46.101(b)(2) .

This part of the federal regulations requires that the information be recorded by investigators in such a manner that subjects cannot be identified, directly or through identifiers linked to the subjects. It is necessary that the information obtained not be such that if disclosed outside the research, it could reasonably place the subjects at risk of criminal or civil liability, or be damaging to the subjects' financial standing, employability, or reputation.

You should retain a copy of this letter for your records.