The effect of environmental education on the attitudes and beliefs of hotel housekeepers

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The effect of environmental education on the attitudes and beliefs of hotel housekeepers

by

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A dissertation submitted to the graduate faculty
in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

Major: Hospitality Management

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CHAPTER 1. OVERVIEW

Introduction

The environmental movement in the United States is in the mainstream media, with terms such as “recycling” and “green” now part of our everyday vocabulary. However, there are critics that believe the environmental efforts by businesses are just a popular thing to do right now. These critics believe the environmental movement will fade down the same path as just-in-time inventory, total quality management, six sigma, and other popular business fads. Other scholars believe that sustainability will become a fundamental part of business in general, as everyone must do more to slow down the depletion of the earth’s resources (Larson, Teisberg, & Johnson, 2000). At the current rate of consumption, humans will eventually run out of natural resources to feed, clothe, and shelter their citizens. As Rees (2003) pointed out, the Earth has only about two hectares per capita of ecologically productive land and water, but the average human ecological footprint of an energy-intensive country like the United States is ten or more hectares per capita. As a result of statistics provided by Rees and many others, steps have been taken to expand upon current efforts and slow down the rate of consumption.

The hotel industry has been a leader in environmental awareness, with LEED (Leadership in Energy and Environmental Design) certified hotels becoming the standard for new hotels, and resource management plans adopted by many of the leading companies. LEED certified construction has become more prevalent in the hotel industry as costs have dropped significantly and hotel brands have adopted LEED standards into their design criteria and building prototypes. Although it is difficult to retrofit an existing hotel to comply
with LEED standards, some of the LEED standards can be adopted when renovating. Although many existing hotels use green products when renovating, the majority of hotels looking to help the environment adopt resource management programs to measure water, energy, and waste.

**Operational Definitions**

*Anthropocentrism:* “a doctrine which posits humanity as the centerpiece of the universe and sees the well-being of mankind as the ultimate purpose of things” (Chandler & Dreger, 1993, p. 169).

*Ecological crisis (eco-crisis):* potentially catastrophic environmental changes (Dunlap, Van Liere, Mertig, & Jones, 2000).

*Human exemptionalism:* the idea that the constraints of nature that affect other species do not affect humans (Dunlap & Catton, 1994).

*Municipal solid waste:* household waste or garbage including solid waste created by institutions, schools, and businesses. This does not include items that have been separated out to be recycled or industrial waste created by businesses in producing finished goods (Vaughn, 2009, p. 296).

*New Environmental Paradigm Scale:* an instrument that measures environmental attitudes and behaviors (Dunlap & Van Liere, 1978).

*New Ecological Paradigm Scale:* an instrument that measures environmental attitudes and behaviors (Dunlap et al., 2000).

*New Ecological Paradigm for Children Scale:* an instrument that measures environmental attitudes and behaviors of children (Manoli, Johnson, & Dunlap, 2007).
Recycling: “separation of materials in the waste stream so that some of the materials can be reused” (Vaughn, 2009, p. 14).

Rights of nature: a belief that nature has value that should be respected by humans (Nash, 1989).

Significance of Study

The purpose of this study was to examine whether recycling training can cause a change in environmental attitudes and beliefs for hotel housekeepers. In particular, do the housekeeper beliefs change in regard to the rights of nature, eco-crisis, and human exceptionalism themes established by Manoli et al. (2007).

Existing literature concerning the environmental movement in hotels is concentrated on consumer behavior toward green hotels (Carlson, Grove, & Kangun, 1993; Straughan & Roberts, 1999) and cost savings at hotels that adopt green practices (Carlson et al., 1993; Kasim, 2006). Although gauging whether customers are willing to pay more for hotels that adopt green practices and saving financial resources are important, human resources are not often considered for their environmental contributions. Employees who are in direct contact with guests can make a huge impact on the 3Ps (people, planet, and profit) that Elkington (1997) believed are the motivation for environmental behavior. Waste management seems to be the first step in implementing an environmental program, and housekeeping employees can make a large impact on the hotel’s waste management effort by separating recyclable waste.

After reviewing both the general business and hospitality literature, no empirical evidence was found that had directly evaluated employee attitudes toward the environment despite the fact that employees are the biggest stewards of a hotel’s environmental program.
There is a significant amount of literature concerning hotel employees in the areas of job satisfaction, attitudes, behaviors, and motivation (Dermody, Young, & Taylor, 2004; Enz, 2001; Inman & Enz; 1995, Stamper & Van Dyne, 2001; Woods & Macaulay, 1989); however, research concerning environmental education in hotels is lacking. The goal of this study was to determine if employee attitudes and behaviors concerning the environment change after receiving environmental training. A change in attitudes after training hopefully translates into a change in employee behavior and more commitment to the hotel’s environmental program.

**Statement of Problem**

The hotel industry faces unique problems in trying to implement good environmental practices. One of these problems is that hotel guests throw away materials that can be recycled, and these items are taking up space in landfills when they could be reused. Hotel housekeepers remove from hotel rooms solid waste materials that guests have thrown away and can increase a hotel’s recycling rate by separating recyclable materials from the non-recyclable solid waste. Housekeepers may not currently separate recyclable materials from solid waste because they may not realize the impact of their recycling efforts. Recycling training can give housekeepers additional information about the impact of their recycling efforts. The additional environmental knowledge learned during environmental training may change housekeeper attitudes and beliefs as measured by Manoli et al.’s (2007) New Ecological Paradigm Scale.

The New Ecological Paradigm Scale (Dunlap, et al., 2000), has been used extensively to measure environmental attitudes and beliefs, and has been tested for both reliability and validity. Manoli et al. (2007) developed a simplified and easier-to-understand version of
New Ecological Paradigm Scale called the New Ecological Paradigm for Children Scale. The present study uses Manoli et al.’s (2007) scale to analyze the pre-training and post-training environmental attitudes and behaviors of hotel housekeepers. This instrument was chosen because the simplified wording and the reduced number of items in the children’s version are easier to understand for employees with lower literacy levels and nonnative speaking employees. The children’s version has only 10 items versus 15 in the original New Ecological Paradigm, and there are 4 anti-New Environmental Paradigm items in the children’s version versus 7 in the original version. Manoli et al. (2007) categorized the 10 items in the children’s version into three common themes of human exemptionalism, ecological crisis (eco-crisis), and rights of nature; Dunlap et al. (2000) categorized their 15 items in the original version into the categories of ecological crisis, human exemptionalism, anti-anthropocentrism, limits to growth, and balance of nature.

**Hypotheses**

The following research hypotheses provided the basis for data analysis:

$H_01$: The scores reflecting the attitudes and beliefs of hotel housekeepers concerning the environment will increase as a result of environmental training.

$H_02$: The scores reflecting the combined attitudes and beliefs of hotel housekeepers concerning rights of nature will increase as a result of environmental training.

$H_03$: The scores reflecting the combined attitudes and beliefs of hotel housekeepers concerning an ecological crisis will increase as a result of environmental training.

$H_04$: The scores reflecting the combined attitudes and beliefs of hotel housekeepers concerning human exemptionalism will increase as a result of environmental training.
Assumptions

The following assumptions were made:

1. The sample of employees used in this study was sufficiently large enough to be representative of all housekeepers.
2. The instrument used could adequately measure the environmental attitudes and behaviors of the participants.
3. The environmental attitudes and behaviors of the participants are not deeply rooted beliefs, and a change in attitudes and behaviors can occur.
4. The pretest scores are not so large as to not have room for increase.
5. The training was properly chosen to induce a change in attitude and behavior.
6. The responses obtained were not a result of socially desirable responses (Crowne & Marlowe, 1960).
7. The study could be replicated.

Limitations

1. The sample of employees used in this study had to take the survey both times at both the control and experimental hotels or the impact of training would not be recognized.
2. All items on both surveys had to be completed in order to receive an aggregate score. Any missing items would make that survey invalid.
3. The training was done in English and may not have been understood if the housekeeper’s comprehension of English was limited.
4. The 60-day time period between the pre-survey and post-survey may have caused some of the initial change in environmental attitudes and behaviors to be forgotten.
Summary

This study was the first to look at environmental attitudes and beliefs of hotel housekeepers regarding the environment. Housekeepers are vital to the success of the hotel industry, yet according to existing literature, their attitudes and beliefs have not been studied. This research was designed to show hotel managers if environmental training influences employee attitudes and behavior and the areas where their attitudes and behavior are influenced. The changes in hotel housekeepers’ attitudes and beliefs were evaluated using the New Ecological Paradigm for Children Scale.
CHAPTER 2. REVIEW OF LITERATURE

The Environmental Movement

Definition of Sustainability

Sustainable development was defined in 1987 by the Brundtland Commission as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (Brundtland, 1987, p. 51). This definition of sustainable development is the most commonly used, however the definition has evolved and changed over the last 20 years. It appears that there were many attempts to clarify the definition of sustainability after the Brundtland Commission definition was released (Brown, Hanson, Liverman, & Merideth, 1987; Redclift, 1992; Shearman, 1990), and each attempt has its unique features. The three definitions that commonly appear in sustainability literature are the joint statement from the International Union for Conservation of Nature (IUCN), the United Nations Environment Programme (UNEP), and the Worldwide Fund for Nature (WWF) (IUCN, UNEP, & WWF; 1991), Hawken (1993), and the U.S. President’s Council on Sustainable Development (1994).

The IUCN, UNEP, and WWF (1991) stated that sustainability is “improving the quality of human life while living within the carrying capacity of supporting ecosystems” (p. 10). This definition asks for an improvement in quality of life, whereas most other definitions ask for maintenance (Barbier, 1987; Costanza, Daly, & Bartolomew, 1991, Meadows, Meadows, & Randers, 1992). The Brundtland Commission’s definition also asks for maintenance in saying sustainable development should “meets the needs of the present without compromising the ability of future generations to meet their own needs”
(Brundtland, 1987, p. 51) however, it does not ask for an improvement in the quality of life. Hawken (1993) stated, “Leave the world better than you found it, take no more than you need, try not to harm life or the environment, and make amends if you do” (p. 139). In this definition, Hawken acknowledges that people will use the Earth’s resources and he almost accepts that some harm will occur because he says to “try not to harm . . . the environment.” Hawken’s definition is very contrary to the IUCN, UNEP, and WWF (1991) definition but similar to Brundtland’s (1987).

The U.S. President’s Council on Sustainable Development (1994) stated:

Our vision is of a life-sustaining earth. We are committed to the achievement of a dignified, peaceful, and equitable existence. We believe a sustainable United States will have an economy that equitably provides opportunities for satisfying livelihoods and a safe, healthy, high quality of life for current and future generations. Our nation will protect its environment, its natural resource base, and the functions and viability of natural systems on which all life depends. (p. 1)

This definition openly states that a high quality of life is expected and it differs from all previous definitions as it includes mention of the economy within the definition of a life-sustaining earth. This economic reference comes from a developed nation that has financial resources available and is not just worried about survival. In contrast, the joint IUCN, UNEP, and WWF definition comes from organizations that represent all nations, both developed and undeveloped. Many of these nations are hoping to improve their quality of life and must use the earth as part of their development plans.

Philosophically the Brundtland (1987) and Hawken (1993) definitions lean more toward a definition of sustainability, while the U.S. President’s Council’s (1994) definition
sounds like advancement of standards as a result of the economic resources available in the United States. The IUCN, UNEP, and WWF (1991) definition is accurate because it wants developed countries to start making some desperately needed repairs to the Earth and its atmosphere that resulted from the industrial revolution. These repairs will occur while the undeveloped nations use the earth to increase their quality of life.

**History of the Environmental Movement**

Environmentally conscious behavior can be traced back in history as ancient societies realized that it is easier to reuse a product than to produce a new one. Some citizens did not see the benefit of protecting the environment, and laws had to be created to force citizens to adopt behaviors that did not deplete the environment. The first environmental law in the United States, titled the Rivers and Harbors Act (1899), passed in 1899. This act showed that U.S. citizens were starting to be concerned about the environment. In particular, Section Thirteen, known as the Refuse Act, covered dumping waste into flowing waters (Cowdrey, 1975). Since 1899, the United States has passed laws and amendments for clean air, clean water, and solid waste disposal (see Appendix A), however the international community feels that more should be done. Most of the recent environmental legislation supported by the international community has not been supported by or signed by the United States. In theory the United States agrees with these attempts, however domestic legislation and enforcement are the problem. Instead of national legislation, states police themselves by creating legislation on municipal solid waste, water quality, and other environmental issues. Bottle bills have been passed in 11 states, creating a deposit on recyclable bottles and cans, and these programs have stayed in place even though curbside recycling is now available in many of these states (Container Recycling Institute, n.d.).
Although the early attempts at protecting the environment were better than no effort, the beginning of the modern environmental movement is difficult to pinpoint. The release of Rachel Carson’s (1962) book *Silent Spring* is one significant event in environmental history, as this book brought the environmental movement closer to the forefront. Previous literature covered areas of global warming and population overcrowding, but these concepts were too intangible and did not affect daily lives. Carson painted a gloomy picture of the long-term environment damage caused by the pesticide DDT to rivers, plants, and animals and brought environmental awareness into a new light. The domestic production of DDT was banned as a result, and *Silent Spring* is recognized by many as the starting point in the United States for modern environmental protection through governmental action. Although *Silent Spring* brought attention to the environmental movement, different groups may give a different starting date as the beginning of the environmental movement. Many environmentalists consider the start of the space program as the beginning of the modern environmental movement as citizens were able to see Earth from outer space and thus started to look at our planet differently. Other environmentalists look at the first Earth Day on April 22, 1970 or the United Nations Conference on the Human Environment (UNCHE) in 1972 as the starting point.

Internationally, the deterioration of the earth’s natural resources became a global issue at the UNCHE held in June of 1972 (UNCHE, 1972). This international gathering on environmental issues is considered to be the starting point for much of the “green” movement and sustainable development. Sustainable development, in simple terms, means using the earth’s resources to satisfy current needs while leaving it in the same shape for future generations to also use. Scientists and economists look at developed nations and their
extreme waste of natural resources as satisfying people’s current needs while compromising the needs of future generations. As a result of this overconsumption, the Union of Concerned Scientists (UCS; 1992) urged the world to act socially responsibly, stating,

We the undersigned, senior members of the world’s scientific community, hereby warn all humanity of what lies ahead. A great change in our stewardship of the earth and the life on it is required if vast human misery is to be avoided and our global home on this planet is not to be irretrievably mutilated (p. 1).

This warning from the UCS came 20 years after the UNCHE and showed that quite a bit of work still needs to be finished, especially in the United States, before the world is considered sustainable.

The Stockholm Declaration, which resulted from the UNCHE, is a historic piece of environmental legislation that has been built upon for over 35 years. The UNCHE confirmed that worldwide action needed to take place in order to correct environmental problems, and Principles 21 and 24 from the Stockholm Declaration are frequently quoted. Principle 21 states that:

States have, in accordance with the Charter of the UN and principles of international law, the sovereign right to exploit their own resources pursuant to their own environmental policies, and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other states or of areas beyond the limits of national jurisdiction (UNCHE, 1972, p. 5).

Principle 24 stresses the duty of governments to cooperate through multilateral or bilateral arrangements or other appropriate means in order to control, minimize, or eliminate adverse environmental effects (UNCHE, 1972).
The strength of the Stockholm Declaration carried the sustainable movement for 10 years, however growing concern about the environment and the global consumption of natural resources led to the next major event in 1983. The United Nations adopted a resolution that created the Brundtland Commission to establish sustainable development policies (Brundtland, 2007). This commission, headed by Dr. Gro Harlem Brundtland, created the *Our Common Future* (1987) publication, which is credited with starting the UN General Assembly’s discussion of the environment and development as a single topic. The Brundtland Commission stated that future needs should not be compromised because of current needs (Brundtland, 1987). The Bruntland Commission also created a report recommending political changes and immediate attention to implementing sustainable development strategies.

Although the 1972 Stockholm Conference has been recognized by many as the starting point of sustainable development, another monumental environmental conference was not held until 20 years later, in 1992. The initiatives recommended by the Bruntland Commission led to the next conference on the environment, the United Nations Conference on Environment and Development (UNCED), also known as the Earth Summit (United Nations, 1992). The Earth Summit was held by the United Nations from June 3-14, 1992 in Rio De Janeiro. As a result of the Earth Summit, Mertig and Dunlap (1995) stated that the environmental movement was one of the most successful social movements of the 20th century. The key reasons for its success are strong public approval of the movement’s goal of environmental protection and the number of items that were adopted because of the Earth Summit. These items include Agenda 21, the Rio Declaration on Environment and

Agenda 21 is a wide-ranging plan that attempts to achieve sustainable development worldwide; the Rio Declaration of Environment and Development stated, “The goal of establishing a new and equitable global partnership through the creation of new levels of cooperation among States, key sectors of societies and people” (United Nations, 1992, Vol. 1, p. 3). The Commission on Sustainable Development was created to implement the Agenda 21 items, and its work culminated in two historic sustainability documents. The 1996 Indicators of Sustainable Development, Framework and Methodologies suggested 134 indicators of sustainable development (Spangenberg, Pfahl, & Deller, 2002). As these indicators were put to a field test, they were refined and resulted in a final version titled Indicators of Sustainable Development: Guidelines and Methodologies, which was published in 2001. In both versions, the indicators are divided into four issue areas: economic, environmental, social, and institutional (Spangenberg et al., 2002).

In 1997, The Kyoto Protocol was developed as a result of the United Nations Framework Convention on Climate Change.

Industrialized countries committed themselves to limit or reduce their emissions of greenhouse gases (CO₂, CH₄, N₂O, hydrofluorocarbons (HFCs), perfluorocarbon (PFCs), SF6) by 5.2% in relation to the base year of 1990 for the former three gases and 1995 for the latter three gases (Plochl, Wetzer, & Ragossnig, 2008, p. 104).

Countries that could not reduce emissions of these GHGs were supposed to engage in emissions trading with countries that were already below the standards of the Kyoto Protocol.
The 2002 World Summit on Sustainable Development in Johannesburg, also known as Rio +10, did not result in any monumental agreements or documents. However, it may be recognized in the future as the turning point when wealthy nations started to acknowledge their unsustainable patterns of development resulting from material and energy consumption (Cohen, 2005).

The Recycling Movement

The first Earth Day celebration on April 22, 1970 brought environmental issues to the mainstream media, and recycling programs developed worldwide as a result. Recycling programs created a way to save energy while reducing the amount of waste sent to landfills. In the 1980s, landfills were closing throughout the United States as small and poorly run facilities closed and others reached their capacity. This so called “landfill crisis” then gained additional notoriety in 1987 as the Mobro barge filled with trash from Islip, New York traveled up and down the Atlantic coast looking for a place to offload its contents (Thomson, 2009, p. 4). This event caused panic in the waste management industry, and rates went up for solid waste disposal. Environmentalists used this event to promote the recycling movement as a way to reduce the amount of waste heading to landfills, and both households and businesses increased the amount of goods that they recycle. Many businesses soon realized that recycling decreased the number of times that dumpsters needed to be emptied. Recycling cardboard, glass, and plastic became widespread in many businesses including the hotel industry.

Hotels began recycling cardboard, glass, and plastic in order to satisfy their economic, social, and environmental agendas, and they realized these benefits by separating solid waste from reusable materials. Recycling requires more effort on the part of employees
than sending all solid waste to the landfill, however employees are used to the extra effort in municipalities that offer recycling services in residential areas. Employees become used to recycling at home and recycling programs at work are easier to start in municipalities that offer curbside residential service. Dunlap and Scarce (1991) reported that 80% of people recycled bottles or paper in 1990, and the United States Environmental Protection Agency (USEPA, 2008) estimated that 33% of the total municipal solid waste generated in 2008 was recycled.

Although the number of people and the volume of products recycled have increased, many studies have explored why some people do not recycle or do not recycle more often (De Young, 1990; Nyamwange, 1996). De Young (1990) found that not enough information, not enough room to store the items being recycled, and recycling being too much of a hassle were the major perceived barriers to recycling. Not enough information, meaning not knowing exactly what to do to recycle, showed up as a major reason why people do not recycle. This is interesting because it showed people may have a willingness to participate in recycling, however they did not know what to do (De Young, 1990). It has been over 20 years since that study, and single source recycling has made it easier for people to participate in municipal recycling programs. Nyamwange (1996) found that recycling levels would increase if the level of recycling knowledge was increased, better channels of communication were used, and convenience of recycling was improved by placing containers in accessible locations. Other studies have confirmed that recycling bin placement would greatly change recycling behavior (Brothers, Krantz, & McClannahan, 1994; Ludwig, Gray, & Rowell, 1998; O’Connor, Lerman, Fritz, & Hodde, 2010).
The New Ecological Paradigm

As environmental concerns have increased, an increasing number of researchers have attempted to assess people’s level of environmental concern. Measurement scales developed between 1971 and 1989 to assess environmental concern were summarized by Schwepker and Cornwell (1991). Their focus was on scales developed to measure ecologically concerned consumers and variables in these scales such as demographics, culture, personality, attitudes, and place of residence. Their research added to the work of Van Liere and Dunlap (1981) who felt that ecological research at the time included mostly mixed results and inconsistent measures. Early studies in environmental literature assessed man’s dominance over nature and overuse of the earth’s resources. This misuse of the earth’s resources was characterized by the phrase “dominant social paradigm”, coined by Pirages and Erlich (1974). A new social paradigm, called the new environmental paradigm, developed by Dunlap and Van Liere (1978) refuted the claim that nature exists solely to serve human’s needs.

Dunlap and Van Liere created a survey instrument called the New Environmental Paradigm Scale (see Appendix B) in 1978. This scale measures environmental attitudes and behaviors and is one of the most widely used for determining environmental concern (Dunlap & Jones, 2003). The New Environmental Paradigm Scale comprises 12 items that address environmental attitudes of respondents. The items measure beliefs on three facets of environmental attitudes: humans’ ability to upset the balance of nature, the existence of limits to growth, and humans’ right to rule over the rest of nature (Hawcroft & Milfont, 2010). These items were appropriate in 1978; however as time passed, the New Environmental Paradigm Scale was criticized for design flaws and terminology. Critics felt the survey was
too narrow in covering only the balance of nature, limits to growth, and anti-
anthropocentrism, and that worldview facets such as human exemptionalism and ecological
crises also needed to be addressed. The term “mankind” was viewed to be sexist and dated
by many critics and needed to be replaced by the word “humans.” Critics also felt there were
not enough negatively worded items, causing most responses to be answered, “strongly
agree” or “mildly agree”. This directional imbalance created high scores that critics said
influenced respondents towards pro-environmental responses (Dunlap et al., 2000).

Dunlap and Van Liere addressed these concerns by creating the New Ecological
Paradigm Scale with Mertig and Jones (Dunlap et al., 2000; see Appendix C). According to
Dunlap et al. (2000) the New Ecological Paradigm Scale was created to broaden the content,
correct the imbalance between pro- and anti- items, and correct some outdated vocabulary.
The 15 items on the New Ecological Paradigm measure general beliefs concerning the
relationships of human beings to the environment and improve upon the original New
Environmental Paradigm Scale. Dunlap et al. (2000) divided these 15 items into five areas of
an ecological worldview: the reality of limits to growth, anti-anthropocentrism, the fragility
of nature’s balance, rejection of exemptionalism, and the possibility of eco-crisis. Anti-
anthropocentrism views humanity as the centerpiece of the universe where all things are put
on earth for humans’ use (Chandler & Dreger, 1993). The fragility of nature’s balance that
Dunlap et al. (2000) referred to relates to the ability of nature to handle the damage man
inflicts. Exemptionalism is whether mankind rejects with the laws of nature and uses the
earth in spite of the laws of nature. The notion of rejection of exemptionalism would entail
pro-environmental beliefs towards the laws of nature and ways to use the earth while
recognizing the laws of nature.
Anti-anthropocentrism can imply a negative belief in which man is central to all resources on the earth, where anthropocentrism is viewed positively as it looks at the value of preserving earth in order to maintain or enhance the quality of life for humans. Anthropocentrism is often compared to another positive attitude regarding conservation known as ecocentrism. According to Thompson and Barton (1994) ecocentric individuals believe nature should be conserved for its intrinsic value whereas anthropocentrics believe in conservation because human comfort, quality of life, and health all depend on natural resources. These two extremes in environmental ideologies were recognized in Corbett’s (2006) spectrum of environmental ideologies (p. 29), which is illustrated in Figure 1. The anthropocentric belief is depicted by a triangle on the left side and an ecocentric belief is symbolized by a circle located on the far right. Other environmental ideologies are located in between based upon their relationship to the anthropocentric and ecocentric beliefs.

The final term, “eco-crisis,” was used to define a potentially catastrophic environmental change that results from the actions of humans (Dunlap et al., 2000). Dunlap et al. next addressed the criticism that the items were worded in a pro-ecological way and influenced respondents to support the new environmental paradigm. A balance between pro- and anti-new environmental paradigm statements was achieved by wording the eight odd-numbered items so that agreement would indicate a pro-ecological view and disagreement
would indicate an anti-ecological view. The seven even numbered items were worded so that agreement would indicate an anti-ecological view and disagreement would indicate a pro-ecological view.

The New Ecological Paradigm Scale was written at a ninth grade reading level according to the Flesch–Kincaid readability scale in Microsoft Word. This scale measures the reading grade-level of a document in a range from 0 to 12 and has been determined to be both valid and reliable according to Kincaid, Fishburne, Rogers, and Chissom (1975). As a result of the difficulty involved in understanding the New Ecological Paradigm Scale, an alternative to this instrument was explored. In 2007, a 10-item New Ecological Paradigm for Children Scale was developed by Manoli et al. (2007) for children ages 10–12 in the fourth, fifth, and sixth grade (see Appendix D). This instrument is a better fit for surveying housekeepers than a survey based upon a ninth grade reading level. A fourth to sixth grade reading level seemed ideal for surveying housekeepers because a study on informed consent forms by Paasche-Orlow, Taylor, and Brancati (2003, p. 275) determined that a fourth to
sixth grade reading level “conveys key concepts simply and directly” and allows for people with poor literacy skills to participate. Almost half of American adults read at or below the eighth grade level according to Kirsch, Jungeblut, Jenkins, and Kolstad (1993).

The New Ecological Paradigm for Children Scale included three dimensions: rights of nature, eco-crisis, and human exceptionalism. The rights of nature items focus on whether humans have the right to use the earth in any way they please, whereas the ecocrises items target the possibility of a catastrophic event. Human exceptionalism is the idea that humans differ from other species and are exempt from the constraints of nature (Dunlap & Catton, 1994). Simon and other defenders of the Dominant Social Paradigm made this theory well known in the 1980s (Dunlap et al., 2000).

These dimensions also appeared in the New Ecological Paradigm Scale, however when Manoli et al. (2007) validated this instrument, they discovered that some items needed to be recategorized. The 10 items from the Children’s New Ecological Paradigm Scale developed by Manoli et al. and the 15 items from New Ecological Paradigm Scale developed by Dunlap et al. (2000) appear in Table 1 with their new categories that represent a facet of the worldview; Figure 2 shows the model of the items and worldviews.
Table 1.


<table>
<thead>
<tr>
<th>Children’s New Ecological Paradigm Scale</th>
<th>Facets</th>
<th>New Ecological Paradigm Scale</th>
<th>Facets</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Plants and animals have as much right as people to live.</td>
<td>Rights of nature</td>
<td>7. Plants and animals have as much right as humans to exist.</td>
<td>Anti-anthropocentrism</td>
</tr>
<tr>
<td>2. There are too many (or almost too many) people on earth.</td>
<td>Eco-crisis</td>
<td>1. We are approaching the limit of the number of people the earth can support.</td>
<td>Limits to growth</td>
</tr>
<tr>
<td>3. People are clever enough to keep from ruining the earth.</td>
<td>Human exemptionalism</td>
<td>4. Human ingenuity will insure that we do NOT make the earth unlivable.</td>
<td>Exemptionalism</td>
</tr>
<tr>
<td>4. People must still obey the laws of nature.</td>
<td>Rights of nature</td>
<td>9. Despite our special abilities humans are still subject to the laws of nature.</td>
<td>Exemptionalism</td>
</tr>
<tr>
<td>5. When people mess with nature it has bad results.</td>
<td>Eco-crisis</td>
<td>3. When humans interfere with nature it often produces disastrous consequences.</td>
<td>Balance of nature</td>
</tr>
<tr>
<td>6. Nature is strong enough to handle the bad effects of our modern lifestyle.</td>
<td>Human exemptionalism</td>
<td>8. The balance of nature is strong enough to cope with the impacts of modern industrial nations.</td>
<td>Balance of nature</td>
</tr>
<tr>
<td>7. People are supposed to rule over the rest of nature.</td>
<td>Rights of nature</td>
<td>12. Humans were meant to rule over the rest of nature.</td>
<td>Anti-anthropocentrism</td>
</tr>
<tr>
<td>8. People are treating nature badly.</td>
<td>Eco-crisis</td>
<td>5. Humans are severely abusing the environment.</td>
<td>Eco-crisis</td>
</tr>
<tr>
<td>9. People will someday know enough about how nature works to be able to control it.</td>
<td>Human exemptionalism</td>
<td>14. Humans will eventually learn enough about how nature works to be able to control it.</td>
<td>Exemptionalism</td>
</tr>
<tr>
<td>10. If things don’t change, we will have a big disaster in the environment soon.</td>
<td>Eco-crisis</td>
<td>15. If things continue on their present course, we will soon experience a major ecological catastrophe.</td>
<td>Eco-crisis</td>
</tr>
<tr>
<td>2. Humans have the right to modify the natural environment to suit their needs.</td>
<td></td>
<td></td>
<td>Anti-anthropocentrism</td>
</tr>
<tr>
<td>6. The earth has plenty of natural resources if we just learn how to develop them.</td>
<td></td>
<td></td>
<td>Limits to growth</td>
</tr>
<tr>
<td>10. The so-called “ecological crisis” facing humankind has been greatly exaggerated.</td>
<td></td>
<td></td>
<td>Eco-crisis</td>
</tr>
<tr>
<td>11. The earth is like a spaceship with very limited room and resources.</td>
<td></td>
<td></td>
<td>Limits to growth</td>
</tr>
<tr>
<td>13. The balance of nature is very delicate and easily upset.</td>
<td></td>
<td></td>
<td>Balance of nature</td>
</tr>
</tbody>
</table>

Note. Sources: Manoli et al. (2007); Dunlap et al. (2000).
Figure 2. Manoli et al.’s (2007) New Ecological Paradigm Scale for Children.

Business and the Environment

Integrating Business Strategy and Environmental Policy

Hutchinson (1996) recognized financial commitment, unique circumstances, impact of the natural environment, and the degree of top level commitment as the four factors contributing to the merger of business strategy and environmental policy. These factors are critical in any business and should be considered by hotels when implementing environmental training. These factors provide hotels with a starting point for individual hotels, management companies, hotel brands, and hotel chains attempting to merge business strategy and environmental policy. These factors can also be used by independent hotels, associations, and state agencies looking to implement an environmental policy.

Financial commitment. All strategic decisions that require a financial investment should have a cost benefit analysis performed; however, environmental policy changes should not be made solely on the financial analysis. Social factors, such as environmental
good and competitive advantage, cannot be entirely ignored and may outweigh any financial
decision. There have been many studies in the past on how much customers are willing to
pay for green services (Kapelianis & Strachan, 1996; Kassarjian, 1971; Klein, 1990; Laroche,
Bergeron, & Barbero-Forleo, 2001; Reinhardt, 1998; Simon, 1992) and how customers want
green products but feel the hotel should absorb the cost. Hotels need to determine how much
they are willing to pay when adopting green products and practices; in many cases these
costs must be absorbed by the hotel to increase goodwill. For example, a hotel may be
considering removing individually packaged soaps and shampoos in favor of soap and
shampoo dispensers that can be refilled. The hotel should perform a cost–benefit analysis to
see if this move is prudent economically or if the move is beneficial only environmentally.
The cost of the dispensers and the soap, shampoo, and conditioner that will be dispensed
must be considered in the cost–benefit analysis. Some hotels have already made the
conversion from individual products to dispensers. Some of these hotels have publicized that
there was a significant savings in using dispensers. The hotels then decided to use higher
quality soaps and shampoos due to the cost savings associated with dispensers. However,
hotels have found that using higher end products may cost hotels more in the end than
individual soaps and shampoos: Although hotel guests may take home unused individual
containers and soaps, some hotels have found that, because guests really enjoy the high-end
soaps and shampoos, they may bring empty containers to fill with these higher-end products.
Even if there are economic and environmental benefits associated with replacing individual
containers with dispensers, the hotel should also consider the social implication and impact
on guest satisfaction and employee satisfaction. Some guests may have hygiene issues
associated with using dispensers, and housekeepers may have issues with refilling dispensers rather than restocking individual containers of soap and shampoo.

Additional changes, such as replacing incandescent light bulbs with fluorescent light bulbs and replacing existing showerheads with low-flow showerheads, should prove to be cost effective in a very short time. Other environmentally friendly changes may require a larger investment and may not be feasible financially. Existing buildings and older facilities are difficult and expensive to change due to the capital investment required, and the ownership/management may not be willing to undertake such expenses. Hotels that are managed for an ownership group may be hesitant to spend money on major capital items, such as solar panels and wind turbines, because they fear the hotel will be sold or their contract will be terminated. Instead, small investments are made to conserve water and energy. These small investments, as well as implementing a monitoring system, can prove to be financially beneficial. An environmental management system that sets benchmarks and monitors usage can be established to save on utility costs.

With the signing of the International Hotels Environment Initiative in 1993, Hilton International positioned itself as a pioneer in the lodging industry’s environmental initiatives, and its environmental management system is just another example. Hilton International established a reporting system called Hilton Environmental Reporting during the Hilton Environmental Action Month in September 2003. In February 2004, this system was introduced to the European and African regions and helped Hilton Europe and Africa reduce energy usage by 16% over 4 years (Bohdanowicz, 2007). Hilton Environmental Reporting was also used to compare differences in energy and water utilization in the upscale Hilton and midscale Scandic hotels in Europe (Bohdanowicz & Martinac, 2007).
Unique circumstances. Álvarez Gil, Burgos-Jiménez, and Céspedes-Lorente (2001) found that hotels with older facilities put less emphasis on environmental management programs and that larger hotels take advantage of economies of scale and are more likely to have an environmental management program. Small-scale enterprises lack the financial resources for start-up costs and compliance monitoring, which discourages them from participating in environmental protection programs (Erdogan & Tosun, 2009). Independent hotels enjoy a lot of freedom in strategic policy and operating procedures, however they are often constrained financially in receiving education and training. One would expect that additional financial resources for small hotels and independent hotels would allow them to educate their managers and implement new environmental programs. As a result of increased manager education, small and independent hotels can adopt additional green practices. Depending on the payback times, hotels may make the investment in compact fluorescent light bulbs (CFLs), electric hand dryers, and toilets with low flow or no water. These items can be replaced gradually and, although these eco-friendly products are more expensive to buy than a replacement product, their per-use savings can be realized in a matter of months in some cases.

Impact of the natural environment. De Burgos-Jiménez, Cano-Guillén, and Joaquín (2002) stated that most literature uses the terms “environmental management” and “environmental performance” interchangeably. Instead, environmental management should be used to explain how a company regulates its activities to protect the environment, whereas environmental performance should express how the organization’s interaction with the environment impacts the company. Environmental performance in hotels can be accomplished either by auditing individual hotels to measure their impact on the environment
or by measuring and comparing environmental performance of different hotels (De Burgos et al., 2002). Environmental performance statistics in the area of waste management are important to hotel general managers. Currently hotels are able to send occupancy and daily rate information to Smith Travel and Research, and their information is compared against their competitive set. A system of measuring environmental information concerning recycling, comparing one hotel to another, could be developed. A ratio such as average daily weight or weight per occupancy could be determined, and daily measures could be reported and compared versus their competitive set.

**Commitment of upper management.** Chief executive officers (CEOs) are known to create the culture of a corporation, and in turn, the attitude and environmental behavior of the organization’s members is significantly affected by the culture (Fineman & Clarke, 1996). Chinander (2001) discovered that employees received and acted on the message that environmental performance is important when top management placed a high importance and commitment to environmental policy. Corporate leadership and CEO commitment are recognized as the driving factors in the success of environmental programs at lodging companies (Scanlon, 2007). Rivera and De Leon (2005) looked at the critical factors that would motivate environmental behavior by CEOs and found that education and environmental expertise rated higher than did income and origin from a developed country.

In 1993, the CEOs of 11 major international hotel chains signed the IHEI, which was launched by the Prince of Wales. These 11 hotel chains, including Accor, Forte PLC, Hilton International, Holiday Inn Worldwide, Intercontinental, Marriott, Ramada, and ITT Sheraton, were bound by this initiative to promote high environmental standards (International Hotels Environmental Initiative, 1993). The IHEI prompted the Hotel and Catering Institute
Management Association to participate in the World Travel and Tourism Environmental Research Centre’s Green Globe environmental management awareness program in 1994 (Mensah, 2006). Individual hotels soon started to initiate their own participation in environmental programs, and the environmental movement started to move from the CEO level into operations. Research by De Burgos-Jiménez and Cespedes-Lorente (2001) supported integrating environmental protection measures at the operations level. They found that environmental protection measures integrated into the operations strategy can support corporate strategy.

Corporations must be careful about the way they implement new environmental strategies as many hotel general managers are not aware of environmental issues and need training. One European Union project, called HOTRES, was designed to educate 200 hotel managers about solar thermal, solar passive, solar photovoltaic, geothermal energy, and biomass systems (Karagiorgas et al., 2006). Erdogan and Tosun (2009) found that few tourist accommodations have the ability to improve environmental performance (EP) or motivate staff to improve environmental performance, whereas another study found that many hotel managers do not even know about the hotel environmental organizations IHEI and the International Hotel and Restaurant Association (Bohdanowicz, 2005).

The Triple Bottom Line

The environmental, economic, and social dimensions of sustainability were combined by Elkington (1994) into what he called “the triple bottom line” (Figure 3). In his opinion, companies should be concerned not only with their economic bottom line, but also with their environmental and social bottom lines. He expressed that the economic bottom line received too much attention and that environmental and social issues needed to be considered more.
The triple bottom line is easy to understand, however later he coined the phrase 3Ps, which stands for “people, planet and profits,” as a simpler way to state the social, environmental, and economic bottom lines (Elkington, 1997).

The economic bottom line is easy to address because companies can easily see if their revenues are greater than their expenses. This bottom line surplus, known as a profit, is a basic business concept that is easily understood. The environmental bottom line is difficult to determine because in many cases businesses do not know the impact of their actions on the environment. In most cases this bottom line deficit, known as a loss, is larger than companies realize because most businesses do not measure greenhouse gas emissions and other by-products they create that are depleting earth’s natural resources. One way of measuring the depletion of natural resources is by looking at the carbon footprint of an activity, however there is confusion regarding the definition used to describe a carbon
footprint (Wiedmann & Minx, 2008). Wiedmann and Minx (2008) tried to clarify the confusion and stated that “the carbon footprint is a measure of the exclusive total amount of carbon dioxide emissions that is directly and indirectly caused by an activity or is accumulated over the life stages of a product” (p. 4). This definition is important because many processes are becoming carbon neutral and no longer emit carbon dioxide (Perry, Klemes, & Bulatov, 2008).

The environmental and social dimensions became issues only when companies realized their effect on the economic bottom line. The social dimension became a factor to corporations when customers stopped buying products that were not environmentally friendly or when new regulations, such as the 1989 excise tax on ozone-depleting chemicals, heavily taxed products (Barthold, 1994). The social dimension is very similar to the environmental dimension because corporations have a hard time measuring both of these bottom lines. This difficulty means that the social bottom line is often ignored. Each of these individual elements—environmental, economic, and social—affect the other two, however a review of each individually can help businesses to focus their efforts.

**Economic dimension.** The economic dimension of sustainability has always been a focus of business because a business that does not produce a profit will not survive. This line of thinking has expanded over the years, and just making a profit is not sufficient for publicly traded companies. Instead, shareholders expect their companies to produce a certain level of profit (earnings) or the CEO may lose his or her job. This short-term timeframe causes the economic bottom line to become a priority over the social and environmental bottom lines in most companies. Shareholders do not encourage the CEO to ignore these other two, but
maximizing shareholder wealth has always been a priority because quarterly earnings are easily measurable.

Hotels are attempting to reduce their carbon footprint out of goodwill, but also because social responsibility measures may increase revenues and decrease costs. This was confirmed by Carlson et al. (1993), who discovered that socially responsible businesses are likely to see an increase in business volume due to their good deeds. These researchers found a growing segment of consumers that intentionally reward businesses that attend to environmental issues through their business practices. Large hotel corporations began incorporating environmental and social measures, including water conservation, energy management, and waste management programs, as part of their corporate strategy during the 1990s (Kasim, 2006). Hotels soon realized that they could increase their revenues through recycling and also lower their expenses by reducing and reusing materials (Kasim, 2006). Hotels realized simple conservation actions, like having a manager walk around and survey wasteful practices, can reduce costs and increase profits (Stipanuk, 2001). Research has shown that economic concern, rather than environmental concern, provides the motivation for reducing resources (Kirk, 1998; Stipanuk, 1996; Stipanuk & Ninemeier, 1996).

**Social dimension.** Although profits are extremely important to corporations, items other than the product itself can contribute to a company’s revenues. Crook (2005) stated that businesses ought to justify their existence in terms of service to the community rather than mere profit. As corporations became international, they started to look at their customers and other stakeholders, such as suppliers and employees, that are affected by the way they conduct business. The phrases corporate responsibility and corporate social responsibility were used to describe the role of business in society. Corporate social
responsibility may be defined as an overall ethic or vision that implies the need for businesses to contribute back to the communities and markets that have made them successful (Smith, 2003). Corporate social responsibility applies not only to the way companies give back to the communities in which they do business but also to the legal and ethical standards a company follows. Although in the past companies’ legal and ethical standards were not questioned, companies such as Enron and Halliburton have caused the public to be leery of corporations.

Other charitable work done by a company, such as volunteering for Habitat for Humanity or Relay for Life, also shows a company’s corporate social responsibility. These actions can create positive goodwill for the company as do monetary contributions and donated items. The lodging industry has recognized the positive impact of implementing and promoting corporate socially responsible policies and strategies in creating brand loyalty toward lodging properties and their parent corporations. From an employee standpoint, positive corporate social responsibility can develop into company loyalty, and employee retention may increase as a result of the positive corporate social responsibility (Knox & Maklan, 2004; McGehee, Wattanakamolchai, Perdue, & Calvert, 2009). Ultimately a positive impact on the community and a positive social bottom line should lead to higher sales and an increased economic bottom line. McGehee et al. (2009) tried to quantify the social parameter and determined that the U.S. lodging industry made contributions worth over $815 million in 2005. As part of that study, the process of donation selection by the U.S. lodging industry was also examined for written policies and processes (McGehee et al., 2009).
**Environmental dimension.** Actions to reduce greenhouse gas emissions need to be performed not only in the industrialized part of the world but also in the emerging energy consuming economies of China, India, and Brazil (Opschoor, 2008). Many disagree with this assessment, believing that developed countries have overused the earth for years and that developing countries should not be limited to make up for the depletion caused by developed countries. Gladwin, Kennelly, and Krause (1995) stated that the consumption in developed countries, such as the United States, must be scaled down, whereas developing countries should be given a chance to grow in order to alleviate poverty and stabilize consumption. This belief is a central part of the sustaincentric paradigm which is an integration of technocentrism (expansionism) and ecocentrism (preservationism). Sustaincentric theorists believe natural systems are linked with economic and human activities and each must be considered when one is considered. Sustaincentrism is supported by the United Nations, the U.S. National Academy of Sciences, and numerous environmental groups, social action groups, and think tanks (Gladwin et al., 1995).

**Sustainability Practices in the Hotel Industry**

**Promoting Sustainability in the Lodging Industry**

The biggest challenges in implementing an environmental program in the lodging industry is financial; however the size, hotel structure/chain affiliation, age of the building and environmental education level can also influence the environmental management programs that are put in place. Smaller hotels and independent hotels have less extensive environmental programs than do newer, larger, and chain-affiliated programs (Álvarez-Gil et al., 2001).
**Size.** Hotel size is a factor in implementing environmental management practices (Aragon-Correa, 1998; Klassen & Whybark, 1999), as large hotels can take advantage of economies of scale. In many larger hotels there is a dedicated environmental officer at the property who can lead efforts to reduce wasted energy and materials as well as conduct training. Larger hotels also have a greater volume of waste management and use more water and energy. In the area of waste, recycling can reduce the amount of solid waste and reduce the number of times dumpsters are emptied. Cardboard boxes, aluminum cans, plastic bottles, newspapers, office paper, and food waste can be separated from other solid waste and save a significant amount of weight and space in a dumpster. If a hotel is large enough and has a substantial quantity of recycled materials, it may be able to find a recycling company that will pay for its recycled goods.

**Hotel structure and chain.** Strategic planning is extremely complex in the lodging industry because of ownership groups, management contracts, and franchise agreements. These various structures cause confusion when trying to make generalizations and trying to understand strategy. In some cases, the building is owned and managed by one entity and, in other cases, the owner of a hotel building hires someone to manage all operations of the building. Management companies, such as Marriott, Starwood, Intercontinental, and Hilton, can have its own brands, or a management company, such as Crestline, Davidson, Remington, and Interstate, can sign a franchise agreement to operate a hotel under a brand name. Interstate, for example, manages hotels under 35 different franchise affiliations including Marriott, Hilton, Residence Inn by Marriott, Hampton Inn, Sheraton, Courtyard by Marriott, and Crowne Plaza (Interstate Hotels & Resorts, Inc., 2009). In a traditional franchisor–franchisee agreement, the franchisor receives use of the brand name, national
advertising, a national reservation system, and a listing in the franchisor’s directory in return for paying franchise fees. The franchisee also uses the franchisor’s standards of operation so that the customer will receive the same quality of service from every franchise in the brand regardless of who owns or manages the hotel. Guests who do not know a particular property in a city rely on the brand name to reduce the risks associated with staying at an unknown property (O’Neill & Xiao, 2006). Also important to the franchisee is the stability and the probability of success that a brand name brings. A national reservation system and national advertising helps a national brand franchisee, and research shows that the failure rate of franchises is much lower at chain hotels than at independent hotels (Ingram & Baum, 1997).

Strategically, a management company tries to expand by having more ownership groups as customers regardless of whether they have their own brand or if they have to sign a franchise agreement. The management company’s strength lies in the number of different brands they currently manage or can manage for a building owner and the knowledge they bring to an ownership group concerning which brand is best for a particular building. The management group is limited strategically in that they must follow the strategies of the franchisor, which can often be costly. The hotel’s owner and contracted management company agree to the franchisor’s standards and strategic initiatives when the franchise agreement is signed. Maintaining the brand’s standards can be expensive as logos are changed, new signage is developed, and renovation upgrades are required. It is extremely important to have a complete sense of the franchisor’s vision for the future because the franchisee is contractually committed to make all changes without having a vote in these decisions. In essence the franchisee is blindly saying that it agrees to all strategic changes in advance, because the only recourse it can exercise is to exit the franchise agreement.
A hotel’s owner and management company can only rebrand or rescale (e.g., from upscale to midscale) when the contract expires or through an extremely costly buyout. Hotels can achieve more favorable long-term results when rebranding, however in the short term rebranding may not be an option due to excessive expenses (Hanson, Mattila, O’Neill, & Kim, 2009). Rebranding requires renovation, employee training, and marketing costs that will reduce the hotel’s net operating income in the first year (Hanson et al., 2009) and many ownership and management groups cannot afford to lose money. The impact of rebranding on net operating income may extend into a second and third year depending on economic conditions. From the franchisors’ point of view, they do not want to initiate radical changes in strategy or brand quality because they do not want to lose franchise fees from their franchisees. O’Neill and Matilla (2004) stated in their research that hotel franchisees in the post 9/11 era are very quick to change their brand loyalty and that consistent brand quality may be more important than ever before.

Ownership, management, and brand play an extremely important role in the lodging industry because strategic planning of environmental/green/sustainable practices can be initiated at each of these levels. An ownership group can have a strategic initiative for reducing energy or waste while the brand is implementing a strategic environmental initiative to reduce water usage through a corporate-wide towel reuse program. These strategic issues may conflict with each other, however most environmental initiatives are positive both financially and in goodwill. Hotel companies are more successful in implementing environmental practices when these policies are integrated into their business strategy (Chung & Parker, 2008; Claver-Cortés, Molina-Azorín, Pereira-Moliner, & López-Gamero, 2007; Hutchinson, 1996; Kim & Oh, 2003; Phillips & Moutinho, 1999). Environmental
strategies are adopted by hotels and hotel companies for a variety of reasons that can be summarized into four categories: gaining a competitive advantage, financial, complying with new legislation, and acting socially responsible. Environmental practices have reduced operational costs and enhanced the corporate images of many hotel firms (Kirk, 1998; Mensah, 2006), however legislation and social responsibility may have more influence on environmental strategy.

Brand affiliation can also impact the success of an environmental management program. In the United States, Intercontinental and Kimpton hotels are considered pioneers in initiating environmental programs. Kimpton has created relationships with partners to purchase eco-friendly products (e.g., cleaning solutions) because they realize that being environmentally friendly is the socially responsible thing to do (Jones, 2006). This strategy seems to be working, as Kimpton reports that 16% of their guests stay with them because of their recommended practices, such as the use of nontoxic cleaning agents and in-room recycling bins (Butler, 2008). Intercontinental has introduced The InterContinental Hotels Environmental Manual, which was used to develop environmental guidelines for the IHIE in 1993 (Goodall, 1995). Intercontinental moved into new environmentally friendly headquarters in August 2008 and has redesigned the signs outside its hotels to use an environmentally friendly lighting system. Most important is its new Green Engage online sustainability system, which it estimates will help run a more energy-efficient hotel saving 15–25% (Intercontinental Hotels Group, 2010).

Age of building. New hotels often consider incorporating LEED certification standards developed by the U.S. Green Building Council. According to the U.S. Green Building Council website (n.d.),
LEED is an internationally recognized green building certification system, providing third-party verification that a building or community was designed and built using strategies aimed at improving performance across all the metrics that matter most: energy savings, water efficiency, CO₂ emissions reduction, improved indoor environmental quality, and stewardship of resources and sensitivity to their impacts.

LEED standards, found in the Green Building Rating System, are used to evaluate the environmental performance of a building and are often considered when the hotel is in the design stage. There was a significant premium to building LEED certified buildings when the program began in 2000, but improved technology, materials, and building techniques have reduced the additional costs. The premium for building to LEED standards has dropped to approximately 1–2% of the project costs (Butler, 2008). Many of these project costs can be offset by energy credits and tax incentives offered by federal, state, and local governments or can be recovered in a matter of months through energy efficiencies. LEED certification can also become an issue if the hotel is ever available for sale. LEED-certified buildings with increased efficiencies and lower operating costs should command a premium over noncertified buildings.

Existing buildings are also able to implement an environmental plan through energy conservation, water conservation, and waste management techniques. Some techniques can be implemented with a small investment or when existing fixtures need to be replaced, whereas other techniques require capital improvements or renovation. Energy management comes from a variety of methods starting with the largest consumer of energy: heating, ventilation, and air-conditioning (HVAC) systems. As older HVAC units break down, it may be more economical to replace them with energy efficient units rather than repair an aging
Temperature controls can be easily replaced with time controlled or temperature sensor units. An unoccupied room does not need to be temperature controlled, and although guest satisfaction may suffer when guests return to their room, energy is not wasted.

The environmental literature concerning energy usage in hotels is quite significant as hotels continue to look for ways to cut costs and conserve resources (i.e., Bohdanowicz & Martinac, 2007; Gossling 2002; Nizic, Karanovic, & Ivanovic, 2008; Priyadarsini, Xuchao, & Eang, 2009; Redlin, 1979; World Travel and Tourism Council, World Tourism Organization, and Earth Council, 1995). Energy usage is quite significant in areas with extreme temperatures and higher occupancies. In these areas, electricity is found to be one of the main forms of energy consumption (Chan, 2005; Shiming & Burnett, 2000, 2002; Simmons & Lewis, 2001). Electricity consumption is studied by environmental researchers because electricity generates greenhouse gas emissions that deplete the ozone layer (Becken, Frampton, & Simmons, 2001; Perry et al., 2008). Zmeureanu, Hanna, Fazio, and Silverio (1994) reported that electricity accounted for only 29% of energy use for hotels in Ottawa, Canada; steam accounted for 45%. This is due to the fact that Ottawa has such cold weather and steam is a more efficient source of heat. Shiming and Burnett (2000) found that electricity accounted for 73% of the overall energy use in hotels, and Becken et al. (2001) estimated that electricity accounted for 75% of total energy use in New Zealand. Gossling (2002) compared energy usage at various types of accommodations such as hotels, campsites, and vacation homes. He stated that hotels generally use more energy per visitor than do other types of accommodations because hotels have energy intense facilities, such as bars, restaurants, and pools, and more spacious rooms. Simmons and Lewis (2001) examined a single hotel in Majorca and a single hotel in Cyprus, and discovered that electricity
accounted for 57% and 70% of energy consumption, respectively. Bohdanowicz and Martinac (2007) examined energy and water consumption in 184 Hilton International and Scandic hotels in Europe and determined that hotels waste a significant amount of energy.

Hotels are constantly monitoring costs and trying to act in environmentally conscious manner. Wasteful behaviors by hotels mean that opportunities exist for enhancing energy efficiency and resource conservation. Installation of low-level lighting is one easy solution to conserving energy. CFLs, which do not require any special installation and can replace existing light bulbs, are more expensive to purchase than traditional incandescent light bulbs, but they require about 75% less energy than do traditional light bulbs (USEPA, n.d.a). CFLs developed by General Electric have sales that are growing at double-digit rates, whereas sales of their traditional incandescent light bulbs are down by more than 10% (Butler, 2008).

Energy management also includes examining standby power consumption of appliances in guest rooms as that is one area in which hotels can save electricity. Modern appliances found in hotel rooms, such as televisions, DVD players, and microwaves, use electricity even when they are not in use. This use of electricity while in standby mode leads to significant costs depending on the type and number of appliances in each room. For some appliances the electrical current is used by power adapters waiting for signals from a remote control to be used and by digital clocks; in other cases, the power adapter is waiting to turn on the appliance and does not provide any features. Rosen and Meier (2000) studied video cassette recorders in the United States and found that more electricity is used in standby mode than while actively recording. A study of New Zealand households reported that over 40% of microwaves used more electricity in standby mode than while in use cooking food (Energy Efficiency and Conservation Authority, 1999). Although the total amount of
electricity used by most appliances in standby mode is less than the total amount used when appliances are in use, it has been estimated that in residences standby power can amount to as much as 10% of the total power used (Ross & Meier, 2002).

Newer appliances are more energy efficient and designed to use less standby power than older appliances do, and thus save on the amount of electricity consumed. Hotels can either replace older appliances with more energy efficient ones or they can unplug existing appliances that require standby power when they are not being used. The Energy Star program by the USEPA requires that appliances can only use a certain amount of wattage when turned on, when turned off, and waiting in standby mode. For example, Energy Star televisions “must not exceed power consumption of one watt when in standby mode” in order to display the Energy Star logo (USEPA, n.d.b). A hotel that is replacing existing appliances should consider buying Energy Star appliances that use less energy when powered on and when in standby mode in order to save on electric bills.

Many researchers believe that standby power used by individual appliances is wasted electricity that can be easily reduced at a relatively low cost. The standby power of individual appliances in hotel rooms has not been studied; however there have been numerous studies of standby power used by household appliances. In households, the standby power of all appliances in a home can represent a significant portion of total energy consumption. Standby power is responsible for about 20–60 watts per home according to several studies of developed nations (e.g., Harrington & Kleverlaan, 2001; International Energy Agency, 2001; Lebot, Meier, & Anglade, 2000; Nakagami, Tanaka, & Murakoshi, 1997; Rainer, Meier & Greenberg, 1996; Ross & Meier, 2002; Vowles, Boardman, & Lane 2001). This energy usage accounts for 4–10% of total residential electricity (Lebot et al.,
Translating electricity into carbon gas emissions means that about 1% of total carbon emissions can be attributed to standby power in Organization for Economic Co-operation and Development countries (International Energy Agency, 2001; Lebot et al., 2000).

Meier and Lebot (1999) suggested a one watt maximum standby power requirement for household appliances. The first U.S. regulation of standby power was instituted in April of 1993 when President Clinton issued Executive Order 12,845, which required all federal government agencies to buy only Energy Star-qualified PCs, monitors, and printers. Although it is not a legal requirement for manufacturers to meet these standards, they must conform to these standards to remain eligible for government procurements. As a result, manufacturers modified their products and tested them for Energy Star compliance. This caused Energy Star participation to skyrocket and, in 1998, the Energy Star program expanded from office equipment to consumer electronics such as televisions and video cassette recorders (Sanchez, Brown, Webber, & Homana, 2008). In 2001, President Bush issued Executive Order 13,221, which required that every government agency, “when it purchases commercially available, off-the-shelf products that use external standby power devices, or that contain an internal standby power function, shall purchase products that use no more than one watt in their standby power consuming mode” (p. 3). In 2004, California went a step further, making it illegal to sell consumer electronic devices that exceed the required maximum levels of standby power consumption. Other states have followed California’s lead and established laws that restrict purchases or require that government agencies purchase only products that meet Energy Star requirements. Although these low standby power products may be more expensive at the time of purchase, in the long run energy savings can be quite significant. In one study, annual average standby energy
consumption per household was estimated to decrease by 59% if the one watt standby power maximum proposed by Meier and Lebot (2003) was implemented (Fung, Aulenbach, Ferguson, & Ugursal, 2003).

The existing literature has stated that the largest consumer of energy is climate control (Chan, 2005; Shiming & Burnett, 2000), and the next largest consumer of electricity is refrigerators (Bertoldi & Atanasiu, 2007) as the compressor starts and stops to provide cooling. Hotels can go too far in trying to create a pleasant guest experience and thus use energy inefficiently when trying to create atmosphere. Hampton Inns try to create a welcoming feeling by having housekeepers turn on the nightstand light for the next guest that will use the room. Although the guest most likely will turn the light off during sleep, every room is not occupied every evening, and many times this light is on for days before being turned off.

Conservation of water resources has also come to the forefront, and one way to reduce water usage at hotels is through towel and sheet reuse programs. In-room signs informing guests that a towel reuse program is available has been studied to determine the best way to persuade guests to reuse towels (Goldstein, Griskevicius, & Cialdini, 2007). Almost half of the guests (49.3%) reused their towels when a card stating:

75% of the guests who stayed in this room participated in our new resource savings program by using their towels more than once. You can join your fellow guests in this program to help save the environment by reusing your towels during your stay.

(Goldstein et al., 2007, p. 149).

In addition, low-flow shower heads can be installed in guest rooms and motion sensor faucets can replace existing ones in public areas. Ultra low volume or waterless toilets have been
added at many hotels and hotel restrooms. Hotels also conserve water when irrigating plants. A low-flow lawn sprinkler system can be used, and watering plants at night conserves water as night-time watering uses less water than during the day.

An effective way to reduce waste is to recycle products such as aluminum cans, glass bottles, newspapers, office papers, and cardboard. The Hyatt Regency Chicago estimated that their recycling efforts keep over 1 million pounds of refuse from being deposited into Chicago landfills each year (Enz & Siguaw, 1999), and a study conducted by International ReCycle Co. found waste generation rates of one pound per room and two pounds per suite on a non-checkout day (Hasek, 1991). On a checkout day these rates double, with most waste coming in the form of old newspapers on both checkout and non-checkout days (Hasek, 1991). Newspapers are one of the major forms of solid waste that originates from guest rooms; 16% and 19% of the total weight of waste came from newspapers in 1986 and 1996, respectively (Chan & Lam, 2001). But even recycling of newspapers is not a completely environmentally friendly process because recycling produces solid waste sludge during the de-inking process (Pento, 1999). Chan and Wong (2006) suggested that reducing the use of newspaper appears to be a better environmental measure than recycling.

There are other ways to decrease waste, including replacing lotion and shampoo bottles and soap bars with amenity dispensers in the shower that contain bulk quantities of soap and shampoo. Electric hand dryers have replaced paper towels in many public restrooms, and reusable cloth towel dispensers have also become more common. When paper towel dispensers are available, they have been replaced with hands free paper towel dispensers that use less paper. Although most of these are voluntary measures, members of
the hospitality industry will be more likely to adopt environmental practices if governments become more involved and provide incentives for adoption (Bohdanowicz, 2005).

**Education.** Education is the biggest challenge that the hotel industry faces regarding environmental initiatives. Customers and hotel employees lack the proper knowledge in many areas including the topics of basic environmental knowledge and certification programs. Basic environmental knowledge includes defining frequently used terms such as greenhouse gas, carbon footprint, fluorescent, recycling, LEED, and Energy Star. Although these words are frequently heard or used, many citizens have no clear idea of what they mean. They also have very little knowledge about how their actions impact the environment. Increased education does not always translate into a change in behavior, but increased awareness will hopefully change some behaviors.

One area in which education can affect a hotel’s environmental efforts is the housekeeping department. Housekeepers are in guest rooms daily and have contact with guests and knowledge of guest behaviors concerning energy, waste, and water management. If housekeepers are educated in these areas, the hotel could save a considerable amount of money. Energy can be conserved by having housekeepers adjust the guest room thermostat, turn off lights that are not being used, and unplug appliances such as microwaves and refrigerators that pull small amounts of current when plugged into an electrical outlet. Ross and Meier (2002) estimated that 5–26% of annual household electricity use is lost via standby power. It also has been estimated that at least 70% of household appliances have standby power consumption (Ross & Meier, 2002) with televisions, set-top boxes, and printers accounting for the largest standby losses.
Waste can be minimized and recycling increased if housekeepers know the impact of their actions and act on that knowledge. Many hotels have removed plastic bags because it is estimated that plastic bags take hundreds of years to biodegrade, however there is no proof that they ever will (Lapidos, 2007). Newspapers take 2 to 5 months to degrade (Lapidos, 2007), however the ink from newspapers can be dangerous to the environment. Aluminum cans, cardboard, glass, and cardboard can also be recycled if separated. In fact, some hotels have installed two trash chutes so that recycling and refuse can be separated by housekeepers.

Housekeepers can help with water management in many ways, starting with adhering to the guidelines for towel and sheet reuse programs. Another conservation area is in soap disposal, as many housekeepers have been trained to flush partially used soaps down the toilet. This wastes water, causes an unnecessary expense, and wastes a resource that can be sent to countries where soap is not affordable. Water usage can be minimized by not leaving water running while cleaning. Based upon the examples above it is easy to see the impact that housekeepers can make on the environment.

Motivating housekeepers to conserve resources can be done in a variety of ways. Additional training and signs in the back of the housekeeping areas can serve as reminders of the impact employees can make, and financial incentives can also be used. The research on the successful use of incentives is mixed. A monitoring system has to be established and the incentive plan must be easy to understand so that employees understand how to attain the incentive and to motivate the employees. Measurements are important because employees in departments that do not have a monitoring system in place do not see the impact of their actions on environmental performance. These employees fail to appreciate their impact of
their environmental efforts (Chinander, 2009). The incentive may change behavior in the short term, but the impact may disappear if the incentive is removed. A reward may help in the short term; however it may lose its impact over a period of time as the employees do not feel the change in behavior is worth the incentive. In other cases, the employee will expect the incentive as part of their job even if the goals are not reached.

Luyben and Cummings (1982) found that beverage container recycling in a college dormitory increased as a result of incentives, and Jacobs and Bailey (1982-1983) found that participation in a newspaper recycling program also increased as a result of incentives. De Young’s (1993) research showed that incentives are helpful in the short term, however employees will return to their pre-incentive behaviors once the incentives end. Witmer and Geller (1976, as cited in Jacobs & Bailey, 1982-1983) also studied economic incentives, and questioned whether behavior changes induced by monetary incentives remain in place after the incentive is removed. Another research study by De Young (1990) showed that respondents did not recycle to earn money, but were motivated to recycle to help conserve natural resources.

Environmental education is a key component to a successful environmental plan for all businesses looking to become environmentally friendly. Govindarajulu and Daily (2004) stated that insufficient training may create employees who are unwilling and unable to participate in efforts of environmental improvement. Although environmental education can make employees more willing and able to support environmental efforts, it should also promote responsible citizenship behavior (Hungerford & Volk, 1990) and pro-environmental behavior. Magnus, Martinez, and Pedauye (1997) stated that the main goal of environmental education is to create pro-environmental behavior.
The easiest way to start an environmental plan is to begin a recycling program. The costs to begin a recycling program are quite low, and often involve only a place to store materials and any employee time required to collect and sort materials. Many municipalities already have a program in place to collect recycled materials and provide storage containers for items waiting for pick up. In other areas, independent companies will provide storage containers and pick up recycled materials at no cost to the hotel. These companies collect recycled materials and look for new customers because they can earn a higher rate per pound as their volume increases. After a recycling program has been developed, employees need to receive training as to what types of products can be recycled and where these products need to be placed. Additional environmental education concerning the impact of their efforts should also be included during training. These training efforts are done in an attempt to modify the attitudes and behaviors of the employees, as negative attitudes can result from the extra effort required for a recycling program.

The environmental education literature combines environmental attitudes and behaviors as changes in both result from environmental education programs. To create pro-environmental behavior, environmental education should assess environmental issues, identify any problems, and then find feasible solutions by addressing the affective (attitude), cognitive (knowledge), and behavioral domains (Eiss & Harbeck, 1969). Eiss and Harbeck (1969) created a learning model that recognized these three domains as the components of an individual’s response to the environment. Later, Heberlein and Black (1976) determined that attitude measures specific to a given behavior are better predictors of behavior than are the more general measures such as looking at the cognitive or affective domains. Iozzi (1984) believed that cognition (knowledge) is not sufficient to produce changes in attitude and thus
behavior. Subsequent research by Iozzi (1989) cited the affective domain as the key entry point to be addressed by environmental education. He then studied environmental education as a way to develop environmentally conscious behavior, values, and attitudes (Iozzi, 1989).

The relationship between variables that predict a certain behavior can be understood by incorporating both general and specific-issue attitudes. This theory on attitudes and behavior was supported by Manfredo, Yuan, and McGuire’s (1992) belief that attitudinal research efforts should focus on the question of when attitudes predict behavior, rather than if attitudes predict behavior. McCarty and Shrum (2001) expanded upon the theory of when attitudes predict behavior, stating that pro-environmental attitudes do not always lead to pro-environmental behaviors. In their research, they stated that individuals do not see the direct benefit of their environmental behaviors and they do not see how their environmental efforts influence future outcomes. McCarty and Shrum used a specific environmental behavior, recycling, to show how individuals’ fundamental beliefs of individualism, collectivism, and locus of control influence their environmental beliefs. Wagner and Moch (1986) defined individualism as the condition in which personal interests surpass the needs of the group. The goals of the group are ignored and individual goals are emphasized whenever a conflict occurs between the goals of an individual and the goals of the group. The opposite extreme, known as collectivism, occurs when the demands and interests of the group take precedence over the desires and needs of individuals (Wagner, 1995). Emphasis is placed on the goals of the group, team, or nation rather than personal goals, and conformity takes precedence over independence. Locus of control refers to the extent to which people believe that they have the ability to affect outcomes through their own actions (Rotter, 1966). Individuals weigh the impact of their environmental effort prior to their behavior and determine if the effort they
put forth is worth the reward. When individuals have an empty can that can be recycled, they are forced into the decision of whether to throw the can away in the trash with other municipal waste or recycle it. In many cases the ability to recycle is not readily available and the individual may have to carry the container until a recycling container can be found. If the individual does not realize the impact of recycling one can and the amount of energy saved, then the individual is likely to throw the can into the trash can that is readily available. The theory of locus of control relates to the big picture and how one can make a difference when collectively everyone makes the extra effort to recycle. Most individuals do not see the big picture and the impact of recycling one can. According to the USEPA (2009), recycling one aluminum beverage can save enough energy to run a 100 watt bulb for 20 hours, a computer for 3 hours, or a TV for 2 hours. Environmental statistics concerning recycling might make a difference for some individuals; however the individual still needs to equate the action and the reward. If individuals do not understand that recycling the can power their TV for 2 hours, then they still may not recycle the can.

When examining environmental behavior, it is difficult to find studies linking knowledge and attitude, or attitude and environmental behavior. In one study, Cottrell and Graefe (1997) confirmed that attitudes are predictors of behavior. They also showed that, rather than using a single component, multiple components that make up an attitude are a better predictor than a single component. Their study of boaters on the Chesapeake Bay determined boat length, years of boating experience, perceived boating skill level, and number of days spent boating on the Chesapeake Bay predict general responsible environmental behavior (Cottrell & Graefe, 1997). Powell and Ham (2008, p. 1) conducted a study that included a “well-conceived interpretation/ecotourism product” and found that an
ecotourism experience can positively influence tourists’ knowledge and attitudes toward environmental behavior. They also noted in their research that future research should examine the link between behavior and participation in ecotourism, however they provided no evidence of a link between attitude and behavior.

In the area of attitude research, Newhouse (1990) stated that attitude research could help in learning more about environmental attitudes which then could help in creating environmental education. Kraus (1995) stated that attitude is one of the most important determinants of behavior, whereas Eagly and Kulesa (1997) stated that environmental education does not necessarily foster positive environmental attitudes. Although environmental education can create either positive or negative attitudes, Pooley and O’Connor (2000) supported understanding attitudes first in order to change environmental behavior. Research on environmental attitudes is important seeing as attitudes and behaviors are affected by both environmental education and attitude research.

Training housekeepers can be potentially difficult due to language barriers and educational levels. Reid (1987) discovered that those with limited English proficiency and nonnative speaker of English prefer hands-on kinesthetic and tactile learning techniques. Kinesthetic/tactile learning, also known as experiential learning, entails total physical involvement in learning, and involves activities such as note taking, working on projects, and making items. Additional research showed that active learning has the additional benefit of improving the recall of information (Prince, 2004). Education levels can also create difficulties as many environmental issues covered in training may be beyond the employees’ current level of education. Concepts such as decaying may be beyond the educational level of the housekeeping staff.
A training activity that entails active learning is not only the preferred method of training for nonnative speakers (Reid, 1987), it also provides a higher retention rate of the information provided (Prince, 2004). An extensive review of recycling training was conducted to find a training activity that was easily understood and allowed the housekeepers to participate. Well-known environmental educational programs for children, such as Caretaker, NatureScope, Lost Treasures, Earthkeepers, Sunship Earth, and Sunship III, were evaluated for their environmental training; however these programs were designed for children and did not accomplish the learning objectives of recycling education. Many of these programs are part of a larger system that teaches lessons sequentially, and individual topics cannot be taught independently of the other lessons. A few of these programs take multiple days to complete and some even required an overnight stay. Other programs were tied to specific standards of learning for a given state and required prior scientific knowledge.

The two recycling training exercises incorporate easy-to-understand, hands-on activities that keep the participants active. The first exercise was adapted from an activity titled “How Long Will It Be There” from the Environmental Education Leadership Project (Virginia Department of Environmental Quality [VDEQ], n.d.) with funding from the Virginia Litter Control and Recycling Fund. This activity helps housekeepers understand the length of time it takes for items to decompose, and stresses the importance of recycling, as aluminum, glass, and plastic materials take a long time to decompose. The second exercise was adapted from an activity titled “Recycling Relay,” which appeared in the RE3.org newsletter (North Carolina Division of Pollution Prevention and Environmental Assistance [NCDPPEA], 2010). This activity lets employees separate items that would be found in a guest’s trash can into items that can be recycled and items that are waste. Both of these
exercises were selected as they allow participants to be active while reducing the amount of verbal communication that comes from the instructor. The exercises are meant to be fun and hands on, but as Corbeil (1999) stated, games can also be educational and develop intelligence. Dempsey, Haynes, Lucassen, and Casey (2002) also documented the important role that games have played as an instructional tool throughout history.

**Reasons Hotels Adopt Environmental Strategies**

Hotels, like many other businesses, adopt environmental strategies to improve one or more of the triple bottom line areas (profit, planet, and people) discussed earlier. However, there are many areas unique to the hotel industry that influence a hotel’s decision to adopt environmental practices.

**Competitive advantage.** The two main theories that explain sources of competitive advantage are Porter’s (1980) five competitive forces perspective and Barney’s (1991) resource based perspective. Porter’s theory states that competitive advantage comes from market or industry forces outside of the company, whereas the resource based perspective contends that internal forces unique to the firm create a competitive advantage (Barney, 1991). In looking at Porter’s theory, Olsen (2004) stated that strategy changes in a company develop as a response to environmental forces or in anticipation of a change by taking advantage of an opportunity before the competition. Rather than looking at these two theories as competing, Kim and Oh (2003) stated that Porter’s theory and the resource based perspective are complementary. Kim and Oh believed that a combination of the two can help a hotel company effectively implement a competitive strategy. This framework of combining internal and external forces has been applied by many companies in the hotel industry in the implementation of an environmental strategy. The internal force of employee
initiative as recognized by the largest hotel company in Canada, Fairmont Hotels, has helped them promote an environmental strategy that is effective with employees internally, and customers and suppliers externally. Fairmont Hotels surveyed over 10,000 employees in the 1990s for their views on introducing a green program (Fairmont Hotels and Resorts, 2001). The ideas gleaned from these surveys heightened awareness throughout the company and served as the beginning for their original green action plan. Fairmont’s environmental plan and commitment show how easy it can be to convert employee interest into a powerful competitive advantage (Jayawardena, 2003).

Environmental strategies can be extremely helpful in improving profitability by decreasing expenses. Profitability can also be improved by increasing revenue as a result of adopting environmental policies that are different than the competition. Any competitive advantage should ultimately translate into increased profitability for the hotel. One study of Edinburgh hotels showed how environmental management can create a competitive advantage (Kirk, 1998). Managers of hotels in Edinburgh believed that environmental management provides a marketing advantage over competitors and improves customer satisfaction. They felt their competitive advantage improves public relations while assisting with local community relationships (Kirk, 1998). In another study, Manaktola and Jauhari (2007) tried to determine consumers’ attitudes and behavior toward green practices in the hotel industry and, indirectly, if green practices in the hotel industry create a competitive advantage. Their research found that consumers in India were conscious of environmentally friendly practices, and would prefer to stay at a green hotel if there was no extra charge for green practices and no sacrifice in the quality of service. Ultimately, green practices are a
competitive advantage, according to Manaktola and Jauhari’s study, if they attract additional business enough to offset any additional costs.

**Financial savings.** A competitive advantage is important to hotel companies because hotel products at the same level (e.g., upscale, midscale, etc.) can be very homogenous in the products and services they offer. Any advantage a hotel can create should translate into increased revenues and higher profits. Although this economic theory, that competitive advantage causes higher profits, should exist, research has shown that there is not a clear relationship between environmental strategy and business performance (Claver-Cortés et al., 2007). Some environmental practices are extremely expensive to adopt, and a cost–benefit analysis may be performed to determine if the cost of a new program will justify the financial benefit received.

All strategic decisions require a financial commitment, and strategy is forever entangled with finance. Corporate strategic planning committees evaluate strategy decisions for their return on invested capital or share price (Olsen, 2004). A net present value calculation can determine if a new strategy is profitable or if an alternative strategy makes more financial sense. Strategy planning for upgrading to a new technology may require a significant financial commitment, and in many cases there is no choice except to upgrade. Existing technologies may no longer work, and a cost–benefit analysis is not required to determine if the upgrade is warranted. Strategic planning for environmental strategies is unique because most environmental policies are new for the company and in most cases are not mandated by law. A voluntary strategic decision, such as adopting an environmental policy, may be more difficult because of the combination of financial, social, and competitive issues that need to be considered. One sure way to have voluntary practices adopted is to
prove that they are financially advantageous. When hoteliers’ are provided with evidence of the financial benefits of environmentally responsible practices, their willingness and intentions to adopt increase (Bohdanowicz, 2006).

From a financial perspective, predicting the revenue streams for a new environmental strategy can be extremely difficult, and a new strategy may be adopted even if it does not appear to be profitable. Expenses related to an environmental strategy are easy to predict, but a poor estimation of revenue streams can make a new strategy incorrectly appear to be unprofitable. Revenue streams from green practices can be extremely difficult to predict because their effects may take some time to be recognized (Claver-Cortés et al., 2007). The difficulty in predicting consumer behavior can also make revenue streams difficult to predict. The conflicting research on consumers’ willingness to pay for green products and how much they are willing to pay is a big reason for the problems predicting consumer behavior-related revenue streams.

Lodging companies realize that consumers want green lodging products, however there is conflicting research as to whether customers are willing to pay extra for those products. When it comes to buying green products, research shows that customers are not prepared to pay a premium (Peattie, 1999), or that only a small group of customers are willing to pay for green products (Maibach, 1993; Roberts, 1996). Hotel customers in particular are not willing to pay extra for green practices (Manaktola & Jauhari, 2007). Conflicting research has revealed that customers are willing to pay a premium for green products (Coddington, 1990; Mendleson & Polonsky, 1995; Reinhardt, 1998) and that the hotel industry is able to charge customers higher prices for green products (Choi, Parsa, Sigala, & Putrevu, 2009). Additional research has determined customers want green
products at hotels, but they think the hotels should just absorb the cost of these products (Manaktola & Jauhari, 2007).

When it comes to willingness to pay for green products, different findings may be due to demographical differences. Different parts of the world have different views on environmentally responsible practices and consumers’ willingness to pay for these practices. Three recent studies examined the relationship between green practices and consumer behavior. In particular, Manaktola and Jauhari (2007) found that consumers in India want hotels to follow green practices, but they are not willing to pay for these services. When two hotels are similar in price and quality, the green hotel then has a competitive advantage. Choi et al. (2009) determined that hotel consumers in Greece held higher concerns regarding environmentally responsible practices and were more strongly influenced by hotels’ environmentally responsible practices than were U.S. consumers. The environmental movement in Europe is more advanced than in the United States, resulting in Greek consumers to be more environmentally educated. In another study based in the United States, Han, Hsu, and Lee (2009) showed that consumers’ attitudes toward green behavior have a positive influence on the overall image of a firm. They also discovered that overall image has a positive influence on visit intention, word-of-mouth intention, and willingness to pay more in the United States. These findings concerning overall image confirm Kirk’s (1998) study in which Edinburgh hotel managers believed they would receive a competitive advantage over competitors by adopting environmental strategies.

**New legislation.** Compliance with new legislation is the only reason that many hotels adopt environmental policies; however many countries, especially developing countries, rely on voluntary actions and are not willing to mandate environmental policy. The Certification
for Sustainable Tourism program for hotels in Costa Rica was created in 1997 by the Costa Rican Ministry of Tourism in response to environmentalist’s complaints that hotels are contributing significantly to the degradation of the environment. This voluntary environmental program was designed in partnership with leading academic institutions, the major hotel trade association, environmental organizations, and hotel managers, and an audit team visits each hotel as part of the certification process (Rivera, 2002).

In Ghana, the situation is quite different. Mensah (2006) mentioned existing environmental legislation for hotels in Ghana, however he stated that policies are not enforced. In Ghana, new hotels with more than 40 rooms must conduct and submit an environmental impact assessment to the Environmental Protection Agency, which then issues an environmental permit. The Ghana Tourist Board then issues a license for the hotel to open. Once the permit and license are issued, then environmental management by the hotel tends to end (Mensah, 2006).

In India, all practices are voluntary and environmental concern comes primarily from water shortages. Manaktola and Juahari (2007) wanted to combat the depleting water table in India with a higher tariff for commercial use of water and a law that mandates water recycling. In Turkey there are no laws forcing hoteliers to adopt new practices because there is little concern about environmental issues or any type of voluntary conservation (Erdogan & Baris, 2007).

Developed countries in Europe, North America, and South America are more environmentally conscious than are developing countries due to better economic conditions and environmental education. Although some of the environmental initiatives in these countries are voluntary, environmental laws and treaties are necessary to force large and
small businesses to adopt environmental policies. European countries that are members of the European Union (EU) follow environmental laws that are jointly agreed upon including the European Integrated Pollution Prevention and Control (IPPC) Directive (96/61/CE). The IPPC was established in 2002 to promote reaching environmental goals through energy efficiency and technical advances. Lopez-Gamero, Molina-Azorin, and Claver-Cortés (2009) surveyed the positive effects of the IPPC on the hotel industry in Spain, and Holcomb, Upchurch, and Okumus (2007) discussed the European Modernization Directive. Under the European Modernization Directive, all EU member countries are required to create legislation requiring companies to report employee and environmental activities. These programs by the EU show the commitment Europeans are making toward the environmental movement. This commitment was also recognized in a 2002 World Tourism Organization report, as 46 of the 59 certification programs analyzed were from Europe.

Mexico is behind European countries when it comes to adopting environmental measures. Zurburg, Ruff, and Ninemier (1995) found that voluntary environmental adoptions in Mexico are motivated primarily by cost savings. Revilla, Dodd, and Hoover (2001) studied environmental initiatives in Mexico and discovered that consumer pressures did not have an effect on implementing environmental strategies, but hotels were quick to comply with new legislation.

The United States is one of the largest consumers of the Earth’s resources and also has been one of the last to sign any international legislation. In order to achieve the proper balance between the carrying capacity of the environment versus production, prosperity, and population growth, some experts have estimated that the United States must become 10 times more efficient in the next 50 years than it is currently (Weterings & Opschoor, 1994).
In essence the experts believe the United States can continue its current rate of consumption only if the impact on the environment decreases to one-tenth of the current level. In the United States, voluntary adoptions occur if they are associated with cost savings, but the main motivator in the United States for most environmental initiatives is legislation (Zurburg et al., 1995).

Regulations such as California’s AB-32 Global Warming Solutions have caused companies to adopt new environmental strategies if they want to do business in California. AB-32, established in 2006, had a goal of reducing California greenhouse gas emissions by the year 2010 to the levels they were in the year 2000, and by 2020 reducing greenhouse gas emissions to 1990 levels (Butler, 2008). As a result of this legislation, new buildings are being built with natural sunlight in mind, improved ventilation, and low-emission adhesives, sealants, paints, and carpets.

Although government legislation is the primary motivator for environmental change, Hassan (2000) suggested that less governmental intervention is needed. He suggested more self-regulation in the private sector and that nongovernmental organizations need to become more involved in increasing environmental awareness.

**Social responsibility.** The final reason why a company may adopt an environmental program is corporate social responsibility. McWilliams and Siegal (2001) broadly defined corporate social responsibility as “actions that appear to further some social good, beyond the interests of the firm and that which is required by law” (p. 117). Corporate social responsibility in the hotel industry includes volunteering time and money to local charities. Some corporate-wide programs, such as Investors in People at InterContinental, Spirit to Serve at Marriott, Esprit Accor at Accor, and Best Western for a Better World at Best
Western, provide support to local communities, employees, and other stakeholders (Bohdanowicz & Zientara, 2010). Hotels have also offered charitable acts and donations to relief efforts for the Indian Ocean tsunami (Henderson, 2007) and the Gulf Coast hurricanes in 2005 (McGehee et al., 2009). However, corporate social responsibility efforts toward the environment may have received the most attention from researchers (Grove, Fisk, Pickett, & Kangun, 1996; Holcomb et al., 2007; Kasim, 2006; McGehee et al., 2009; Stipanuk, 2001).

Although hotels and restaurants are required by law to comply with regulations for clean water, clean air, and solid waste, many hotels and restaurants are attempting to reduce their carbon footprint out of goodwill. These firms realize that social responsibility may increase revenues and decrease costs, thus creating a competitive advantage as a result of corporate social responsibility. This was confirmed by Carlson et al. (1993), who discovered that socially responsible businesses are likely to see an increase in business volume due to their good deeds. These researchers found a growing segment of consumers that intentionally reward businesses that attend to environmental issues through their business practices. Kasim (2006) stated that large hotel corporations began incorporating environmental and social measures as part of their corporate strategy during the 1990s. In the 1990s, major hotel chains began developing sustainability programs including water conservation, energy management, and waste management programs. Hotels realized that they could reduce costs and increase profits through simple conservation actions like having a manager walk around and survey wasteful practices (Stipanuk, 2001). Hotels can also lower their expenses by reducing and reusing materials, and they can increase their revenues through recycling (Kasim, 2006).
Hotel housekeepers were chosen to participate in the present study because hotel housekeepers frequently make decisions concerning the implementation of the hotel’s environmental program especially in the area of guest waste and recycling. Hotel guests recycle paper products and plastic more often at home than when traveling (Baker, Davis & Weaver, 2010), causing many items to be thrown in hotel trash that could be recycled. A hotel housekeeper who is cleaning a guest room may recognize that recyclable materials have been combined with other waste and can remove recyclables from the waste. Although this single act may seem insignificant, this behavior over time and multiplied across many hotels can be very powerful. Recycling helps the environment by reducing solid waste in landfills and by saving energy, as it takes less energy to reuse an item than it does to produce a new one. Recycling also saves the hotel money by decreasing the number of dumps by solid waste companies, and in some locations recycled materials provide a revenue stream for the hotel. Recycling can also help a hotel socially as customers and employees will want to be associated with hotels that promote socially responsible behavior (Choi et al., 2009)

Summary

Although there is no clear definition of sustainability, and no definite starting date, environmentalism is not a passing fad but a growing movement that is expanding into businesses including the hotel industry. Many businesses begin recycling programs, as those programs are easy to start and easy to maintain given that separating solid waste requires little effort. Other environmental programs begin for a variety of reasons. Hutchinson (1996) stated that integrating business strategy and environmental policy is centered around the four areas of financial commitment, unique circumstances, impact of the natural environment, and commitment of CEO. These four areas should be addressed if a business,
and in particular a hotel, wants to have a successful environmental program. Elkington (1994) believed that companies are too worried about their financial bottom line and should also be concerned about their social and environmental dimensions. He called the economic, social, and environmental dimensions the triple bottom line, and he described that each company should try to have a positive bottom line for each of these dimensions.

In the lodging industry, an environmental program can be challenging due to the investment in green products that is required. Green products, such as fluorescent light bulbs, are more expensive than the products currently used, and a financial commitment must be made when adopting many green practices. The size, chain affiliation, age of the building, and environmental education level of manager and employees also influence the environmental management programs that are put in place. Most hotels adopt some type of environmental strategy because they either want to gain a competitive advantage or they need to keep up with their competition. Other hotels implement environmental strategies to save money, meet a legal requirement, or to show that they are socially responsible and environmentally conscious.

When it comes to environmental education, there is a lot of work that needs to be done. The term “green hotel” is used by many establishments, but there is plenty of confusion as to what this means. There are many myths about recycling, and many people believe that all municipal solid waste still winds up in the landfill. In addition, there is a lack of training throughout the hotel industry, and more could be done financially, socially, and environmentally with an increased level of education. Many theories exist behind the way to train and what areas should be addressed. Research has shown that environmental attitudes are predictors of behavior (Cottrell & Graefe, 1997). Many researchers have tried to measure
attitudes and behavior, but the most commonly used measure of environmental attitudes and behaviors is the New Ecological Paradigm Scale developed by Dunlap et al. (2000). Manoli et al. (2007) created a simplified version for children, the New Ecological Paradigm for Children, that is easier to read and understand. This version is also suitable for adults who may have literacy issues or are nonnative speakers of English.
CHAPTER 3. METHODS AND PROCEDURES

In this evaluation of environmental training, research questions address how environmental attitudes and beliefs of housekeeping employees exposed to environmental training compare to the attitudes and beliefs of housekeeping employees that do not receive training. In particular, the specific research questions address (a) how the overall environmental attitudes and beliefs in housekeeping employees exposed to environmental training differ from the attitudes and beliefs of housekeeping employees that do not receive training, (b) how environmental attitudes and beliefs concerning rights of nature differ in housekeeping employees exposed to environmental training from the attitudes and beliefs of housekeeping employees that do not receive training, (c) how environmental attitudes and beliefs concerning eco-crisis differ in housekeeping employees exposed to environmental training from the attitudes and beliefs of housekeeping employees that do not receive training, and (d) how environmental attitudes and beliefs concerning human exemptionalism differ in housekeeping employees exposed to environmental training from the attitudes and beliefs of housekeeping employees that do not receive training.

Study Design

The research design consisted of selecting an existing instrument to test environmental attitudes and behaviors. The New Ecological Paradigm (Dunlap et al., 2000) is one of the most widely used instruments for measuring environmental attitudes and behaviors. It contains 15 items that measure five areas of environmental concern. The New Ecological Paradigm for Children, developed by Manoli et al. (2007), was chosen because it uses simplified wording to ask 10 items in only three areas of environmental concern. The
survey was translated and back translated from English to Spanish and Spanish to English for employees who preferred a Spanish version.

The instrument was administered to hotel housekeepers at 28 hotels in the study. After the pretest, the housekeeping employees at the experimental group hotels were given environmental training; the housekeepers at the control group hotels were not given any environmental training or information. After 60 days the survey was administered again to hotel housekeepers at both the control group and experimental group hotels.

A repeated measures analysis of variance (ANOVA; 4-way) was performed to determine the difference in attitude and behavior change between the experimental and control groups. The pretest responses and posttest responses for the control group were compared to the pretest responses and posttest responses for the experimental group. These comparisons were performed for the aggregate score and for the common themes of rights of nature, eco-crisis, and human exemptionalism.

**Participants**

A hotel management company with limited- and full-service hotels in Virginia, Maryland, and the District of Columbia agreed to participate in the study. The hotels included urban, suburban, airport, and resort locations, and ranged in size from 72 to 236 rooms. A total of 35 hotels were targeted to take part in the study with the intention of including eight housekeepers per hotel in the study. Some of the hotels were clustered so that two hotels used the same housekeeping staff and there was no delineation between hotel employees. This brought the total number of units available to 31. The goal for the pretest survey was to have approximately 248 housekeepers participate, and an expected attrition rate of 10% was expected for the posttest. Thus, approximately 224 employees were
expected to take both the pre- and posttests. Individual hotels were randomly selected to be either an experimental or control hotel by the principal investigator and the area operations manager, and a pretest/posttest, control/experimental design was used to assess changes in environmental attitudes and behaviors as a result of environmental training.

The first experimental design using a control and treatment groups dates back to 1908 when Winch’s study (cited in Solomon, 1949) created this standard for when testing for the improvement in memory of schoolchildren. In this research his experimental group received pretest, training, and posttest, while the control group received the pretest, no training, and the posttest(Solomon, 1949). Creswell (2008) stated that an experimental design is used to show cause and effect between the independent and dependent variables. A researcher “attempts to control all variables that influence the outcome except for the independent variable” (Creswell, 2008, p. 299). The independent variable, environmental training, was used to influence the dependent variable, survey responses on attitudes and behaviors, in order to cause a change in the responses. In this design, housekeepers from individual hotels were used as the control group rather than separating individuals that worked together as either experimental or control. If employees from the same hotel were separated into experimental and control, discussions between control employees and experimental group employees may have caused control group employees’ attitudes and beliefs to change as a result of their coworkers training. Thus, to keep a pure control group, and control all variables except for the independent variable, it was determined that an entire hotel should be either experimental or control. This diffusion of treatments creates a threat to internal validity, and “as much as possible, experimental researchers need to keep the two groups separate in an experiment” (Creswell, 2008, p.309). An individual at one hotel is less likely
to speak about environmental training with an employee at another hotel, and therefore a change in attitudes in the control group employees caused by discussions with employees from the experimental group is less likely. It was expected that approximately 112 housekeepers in the control group would take both tests and approximately 112 housekeepers in the experimental group would take both tests. Before any of the housekeepers were given the survey, they completed an Informed Consent Form (Appendix E).

**Instrument**

Research has shown that even short educational programs may stimulate an increase in New Environmental Paradigm Scale scores among children (Manoli et al., 2007) and college students (Rideout, 2005). Even though the New Environmental Paradigm Scale has been criticized by a number of authors (Edgell & Nowell, 1989; Roberts & Bacon, 1997), it is still the most widely used scale for measuring environmental attitudes and behavior. The New Environmental Paradigm Scale was updated by Dunlap et al. in 2000 and renamed the New Ecological Paradigm Scale. This updated version simplified wording and eliminated other concerns found in the New Environmental Paradigm Scale. The New Ecological Paradigm instrument was adapted for use by children in 2007 by Manoli et al. This version is also suitable for adults with lower literacy skills. The version for children removes words that may be difficult to understand by adults with limited English skills, and the simplified wording makes it easier to translate into another language than the New Ecological Paradigm Scale. Many hotel housekeepers are nonnative speakers of English and a translated version of the New Ecological Paradigm for children was made available for Spanish speaking housekeepers.
The New Environmental Paradigm for Children was used in the present study to assess how strongly environmental attitudes are associated with moral obligations. As recommended by Dunlap et al. (2000), the New Environmental Paradigm Scale can be used unidimensionally as a single measure of environmental attitude by summing the items (some reverse coded). The New Ecological Paradigm for Children can also be used unidimensionally. The instrument was tested by Manoli et al. (2007) using a structural equation model using the Goodness of Fit Index, Adjusted Goodness of Fit Index, Comparative Fit Index, and Root Mean Square of Approximation. The results showed that the data fit the proposed model well for both the three-score (rights of nature, ecological crisis, and human exemptionalism) and single-score model (unidimensionally). The three dimensional model fit the data better than did the unidimensional model (Manoli et al., 2007).

The instrument, New Ecological Paradigm for Children, comprises 10 items responded to on a 5-point Likert-type scale with response options available ranging from strongly agree (5) to strongly disagree (1). Of the 10 items, 4 (items 3, 6, 7, and 9) are stated in an anti-new environmental paradigm direction and need to be reverse scored, where strongly agree equals 1 rather than 5, when determining a single score.

Versions Available

The New Ecological Paradigm for Children developed by Manoli et al. (2007) was selected for its easily understood wording. Many housekeepers are nonnative speakers of English and required the survey in another language. As many housekeepers are native speakers of Spanish, it appeared that a Spanish version of the study would be helpful to increase the sample size. The survey was translated from English to Spanish by a native
speaker of Spanish. It was then translated back into English by a native speaker of English to ensure the translation. Although many other languages are used among hotel employees, the Spanish translation was targeted to increase sample size with a large population of housekeepers.

A pilot study of the Spanish version of the New Environmental Paradigm for Children was conducted. The purpose of the pilot study was to determine if the Spanish translation was clear and understandable to the participants. The participants were given the opportunity to provide their feedback about the survey after they had responded to all the items on the survey. Any suggestions made were used to refine the Spanish version of the New Environmental Paradigm for Children for use in the main study. The participants were asked to respond in an honest manner and follow their first instinct when responding.

Employees at two restaurants in Harrisonburg, Virginia participated in this pilot study. These employees were selected as their demographics (education, age, nationality, English comprehension, etc.) closely resembled the study participants. The completed surveys were analyzed with a native speaker of Spanish, who was fluent in both Spanish and English, for suggestions made by the respondents. Suggestions were incorporated into the survey and the revised survey was used for the main study.

Training Method

After the experimental group of housekeeping employees completed the survey, the trainer conducted a training session. Many of the housekeeping employees did not have English as a first language so the trainer had to adapt to this audience. To enhance comprehension for second language learners, Blau (1990) advised using longer pauses between semantic groups rather than slowing down or simplifying syntax. Longer pauses
allow individuals to process the whole meaning rather than spending time deciphering individual words or sentences. Coneth-Morgan (2002) suggested clear enunciation, restatement of ideas, and reformulation of sentences rather than repeating the same words.

The two exercises for this training were meant to educate housekeeping employees and were chosen with two specific purposes in mind. The first training exercise, “The Recycling Relay” (NCDPPEA, 2010) helped employees realize that frequently discarded items are often recyclable. It showed the importance of separating solid waste from recyclable materials and how much trash in a guest room is recyclable versus solid waste. The second exercise, “How Long Will It Be There?” (VDEQ, n.d.), helped employees realize the amount of time it takes for items to decompose if sent to a landfill. This helped employees realize the importance of recycling materials rather than just sending them to a landfill.

The Recycling Relay exercise required the trainer to have two bags of trash with four and half pounds of trash per trash bag. Each trash bag consisted of one and half pounds of recyclable material and three pounds of waste that is sent to the landfill. These items represent the national averages of solid waste generated in a day per person in the United States, and the amount that is recycled and sent to the landfill per day per U.S. citizen (USEPA, 2008). The recyclable items had been cleaned, and the solid waste items, such as Kleenex, Q-Tips and soap wrappers, were put in plastic bags so that the items could be handled without the employee getting dirty.

The trainer placed the plastic trash bag on the ground as the starting point, and a recycling bin and trash was placed approximately 30 feet away from the trash bag. The employees were divided into two teams, and each team lined up behind their bag of trash.
The trainer explained the rules of the game to the two teams and then started the relay. A member of each team pulled an item from the bag, and the team of employees then determined if the item was recyclable or if it was waste. The first employee in each line was instructed to take the item to the recycle bin if it was recyclable and the trash can if it was waste. After the first employee returned from the recycling/trash area he/she went to the end of the line, and the next employee in line removed an item. The team then determined where the next item should go, and the next employee in line delivered the next item to the recycling/trash area. This continued until one team no longer had items in its trash bag.

Once both teams were finished, the employees walked down to the recycling/trash area, the scorecard for each team was completed (see Appendix F), and some basic facts about recycling were shared. A plastic bottle with a #1 logo and a #5 logo on the plastic cup were shown to the employees. The trainer then explained that different plastics have different numbers and that many places recycle only #1 and #2 plastics. The trainer also talked about soap used in hotels and how many hotel chains were going away from individually wrapped bars due to the amount of waste that is generated. The plastic wrappers on individual soaps are not recyclable and used bars of soap are thrown away once the guest departs. One of the latest trends in green hotels is to eliminate waste by having soap and shampoo dispensers in the shower. Hotels can purchase individual bars of soap that are not packaged and then recycle the used bars through Clean the World (n.d.), which sanitizes the soap to remove all impurities and then redistributes the recycled soap products.

The second exercise, How Long Will It Be There?, had housekeepers determine how long they thought it takes for certain items to degrade. The items chosen were those commonly found in the trash, and all were items that could be recycled. A board
was made that had a timeline across the top from right to left (see Appendix G). The shortest time, 1–6 weeks, was on the far left side and the longest time, Never, was on the far right. Other times, 2–4 weeks, 13 years, 200–500 years, 500 years, were listed in left to right order signifying the shortest to longest decomposition rates. The employees were divided into two teams and each team was given a picture of an apple core, paper, cigarette filter, aluminum can, plastic bottle, and rubber band (see Appendix H). Each team then matched the six items to the six dates on the board. Once the team came to a consensus the employees took the pictures and placed them on the board.

After both teams were finished the scorecard for each team was completed (see Appendix I) and some basic facts about decomposition were shared. The estimated time to decompose is determined by respirometry tests (Lapidos, 2007), but plastic does not emit CO₂, an indicator of decomposition. The length of time that aluminum and plastic take to decompose was stressed to both teams. It was explained that it takes less energy to use recycled waste materials than it does to use virgin materials (Wilson, 1979). Recycling of aluminum takes approximately 4% of the energy required to make aluminum from its primary material, meaning one newly manufactured aluminum can from bauxite ore requires the same amount of energy as it takes to manufacture 28 cans from recycled aluminum (Chapman, 1974).

**Data Collection and Analysis**

The data collected were analyzed using the SPSS 19.0 statistical package. The relationships between variables were examined using regression analyses, tests of significance, and correlations. In this quasi-experimental design, the independent variable of
training was manipulated to affect the dependent variable of housekeeper attitudes toward the environment.

Response choices were summed to obtain a total score for attitude and summed totals for rights of nature, eco-crisis, and human exemptionalism. The total score for attitude included the responses to all 10 items and ranged from a possible score of 10 (a negative attitude) to 50 (a positive attitude). Items 3, 6, 7, and 9 were reverse scored (i.e., \textit{strongly agree} = 1 instead of 5) to obtain an overall score.

The aggregate score for rights of nature included the responses for items 1, 4, and 7. The total score for rights of nature ranged from a possible score of 3 (a negative attitude) to 15 (a positive attitude). Item 7 was reverse scored (i.e., \textit{strongly agree} = 1 instead of 5) to obtain an overall score for rights of nature. The aggregate score for eco-crisis included the responses for items 2, 5, 8 and 10. The total score for eco-crisis ranged from a possible score of 4 (a negative attitude) to 20 (a positive attitude). The aggregate score for human exemptionalism included the responses for items 3, 6, and 9. The total score for human exemptionalism ranged from a possible score of 3 (a negative attitude) to 15 (a positive attitude). Items 3, 6, and 9 were reverse scored (i.e., \textit{strongly agree} = 1 instead of 5) to obtain an overall score for human exemptionalism.
CHAPTER 4. RESULTS

Introduction

The purpose of this chapter is to explain the data analysis and present the results from this study. The survey data analysis is presented in four sections. The first section provides an overview of the descriptive statistics related to the pretest survey administered to the participants of this study. The next section presents the descriptive statistics results related to the posttest survey, and the third section addresses the comparison of the pretest and posttest data. The final section presents the findings associated with the testing of the null hypotheses and concludes with a brief chapter summary.

As stated in chapter 1, one of the challenges of studying the long-term effect of environmental training is that the same employees must take both the pretest and, 60 days later, the posttest. The time period between the pretest and posttest may see employee turnover, and also may cause some of the initial change in environmental attitudes and behaviors to be forgotten.

The study design used was a two-way mixed design. There were two independent variables: treatment (no training or training) and time (before or after treatment). Treatment was measured with different participants because an individual participant of the study could be in either the training group or the no-training group, but not in both. Time measured the participants 60 days apart. A 2 x 2 two-way ANOVA was used to test each of the null hypotheses. The participants were hotel employees and, although every hotel was repeatedly asked to participate in both the pretest and posttest surveys, full participation did not occur. All the participants from the hotels in the experimental (training) group provided responses to both the pretest and posttest, however only 12 of 18 control groups provided responses to
both surveys. In the surveys that were received, not every employee who participated in the pretest also participated in the posttest due to days off, termination, or unwillingness to participate. An unbalanced design was used, and Type III analyses were performed on the data results of the 17 control hotels and 11 treatment hotels that did participate in the posttest. The posttest was returned by 11 control hotels and 11 treatment hotels. It is recommended that the ANOVA with unequal sample sizes should use Type III sums of squares for conclusions that do not depend on the size of the samples. These results interpret the means using marginal averages based on the cell means (Keppel & Wickens, 2004).

The training group’s responses were hypothesized to change as a result of attending the environmental education workshop, but the posttest responses from the control group were not expected to change from their pretest responses because they did not receive the training. Other factors could possibly have caused a change in the control group’s responses, but these factors should also have affected the treatment group’s responses. One factor that may have affected both groups was the earthquake that measured 8.9 on the Richter Scale and the ensuing tsunami that occurred on March 11, 2011 in Japan (Harlan, 2011). These events caused an estimated 13,228 deaths (Reuters, 2011) and affected the operation of a nuclear power plant in Fukushima, Japan (Brown, 2011). The pretests were administered in January and February, prior to these catastrophic events. The posttest survey was identical to the pretest, and the events in Japan may have caused a change in responses by both the control and experimental groups.

The survey that was used in this study measured environmental attitudes and beliefs, and the earthquakes and what was shown in the media could have influenced some of the responses. Question three states “people are clever enough to keep from ruining the earth”,

...
however the earthquake caused quite a bit of damage to the earth. The nuclear plant in Fukushima released radioactive material into the air and ocean. As a result plants, animals and humans died from the radioactive material that was in the atmosphere. Plants and animals that did not die were contaminated and determined to be inedible. Although these events were not a direct result of the earthquake, the man-made nuclear power plant caused additional damage. Survey respondents in this study may have felt that the earth was ruined in this case due to the nuclear plant that was developed by man. The respondents may have felt that people were not clever enough to build a plant that could withstand an earthquake, and that man is not clever enough to keep from ruining the earth. Other questions that also may have been influenced by the earthquake in Japan include question five “when people mess with nature it has bad results”, question eight “people are treating nature badly”, and number ten “if things don’t change we will have a big disaster in the environment soon.” Respondents may view nuclear power differently after the earthquake now that they have witnessed the consequences of a nuclear disaster, and thus their answers may have changed based upon the Japanese earthquake.

Each of the study’s four null hypotheses state that a change will occur in the responses of the experimental group as a result of the environmental training. The pretest responses of the experimental group regarding the rights of nature, eco-crisis, and human exemptionalism were compared to the posttest responses to see if the training caused a difference in the responses. The pretest responses of the control group regarding the rights of nature, eco-crisis, and human exemptionalism were compared to the posttest responses to see if there was a significant difference in their responses. A difference in the control group responses could result from an environmental event in the news or other factors that are not
related to this study. The survey responses were also analyzed to see if an overall change occurred in the survey responses in either the experimental or control groups. Although a change in the overall survey responses may occur, the changes in the scores related to the individual hypothesis may not be significant.

**Pretest Results**

Table 2 displays the distribution of the control group’s responses to the 10-item New Ecological Paradigm Scale for Children pretest. Questions 1, 4, and 7 covered the rights of nature, and the control group felt that people do not have the right to use earth in any way they please. Question 1 had 94.2% of the respondents strongly agreed or agreed that plants and animals have the same right to live as humans, while 93.5% of the respondents to question 4 strongly agreed or agreed that people must obey the laws of nature. Question 7 was negatively worded, and 50.3% strongly disagreed or disagreed that people are supposed to rule over the rest of nature. The responses to the eco-crisis questions that target the possibility of a catastrophic event also showed some strong opinions in their responses to questions 2, 5, 8, and 10. Question 2 had 57.1% of the respondents strongly agree or agree that there are too many or almost too many people on earth, while 88.4% of the question 5 respondents felt bad results occur when people mess with nature. Of the question 8 respondents, 79.4% strongly agreed or agreed that people are treating nature badly, while 89.0% of the question 10 respondents strongly agreed or agreed that we will have a big disaster in the environment soon if things don’t change. The human exemptionalism questions, numbered 3, 6, and 9, cover the idea that humans differ from other species and are exempt from the constraints of nature. Respondents did not feel as strong about these items as they did the rights of nature and eco-crisis questions. Only 59.7% strongly agreed or
agreed to question 3 that people are clever enough to keep from ruining the earth while only 51.6% of the question 6 respondents strongly agreed or agreed that nature is strong enough to handle the effects of our modern lifestyle. The results of the remaining human exemptionalism question, question 9, had only 52.6% strongly agree or agree that people will someday know enough about how nature works to be able to control it.

Table 3 displays the distribution of the experimental group’s responses to the same pretest. The rights of nature questions, numbered 1, 4, and 7 showed that the experimental group does not feel that people have the right to use earth in any way they please. Question 1 had 92.9% of the respondents strongly agreed or agreed that plants and animals have the same right to live as humans, while 91.0% of the respondents to question 4 strongly agreed or agreed that people must obey the laws of nature. Question 7 was negatively worded, and only 44.4% strongly disagreed or disagreed that people are supposed to rule over the rest of nature. The responses to the eco-crisis questions also showed some strong opinions in the responses to questions 2, 5, 8, and 10. Question 2 had 66.6% of the respondents strongly agree or agree that earth is becoming overpopulated while 88.8% of the question 5 respondents agreed or strongly agreed that bad results occur when people mess with nature. Of the respondents to question 8, 79.2% of strongly agreed or agreed that people are treating nature badly, while 90.0% of the question 10 respondents strongly agreed or agreed that we will have a big disaster in the environment soon if things don’t change. The human exemptionalism questions, numbered 3, 6, and 9, cover the idea that humans differ from other species and are exempt from the constraints of nature. Respondents did not feel as strong about these items as they did the rights of nature and eco-crisis questions. Only 53.0% strongly agreed or agreed to question 3 that people are clever enough to keep from ruining
Table 2

*Frequency Distribution of the Control Group Pretest Responses (N = 156)*

<table>
<thead>
<tr>
<th>Scale item</th>
<th>Responses (% surveyed)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Strongly agree</td>
</tr>
<tr>
<td>1. Plants and animals have as much right as people to live.</td>
<td>72.9</td>
</tr>
<tr>
<td>2. There are too many (or almost too many) people on earth.</td>
<td>35.7</td>
</tr>
<tr>
<td>3. People are clever enough to keep from ruining the earth.</td>
<td>25.3</td>
</tr>
<tr>
<td>4. People must still obey the laws of nature.</td>
<td>60.0</td>
</tr>
<tr>
<td>5. When people mess with nature it has bad results.</td>
<td>56.8</td>
</tr>
<tr>
<td>6. Nature is strong enough to handle the bad effects of our modern lifestyle.</td>
<td>27.7</td>
</tr>
<tr>
<td>7. People are supposed to rule over the rest of nature.</td>
<td>16.3</td>
</tr>
<tr>
<td>8. People are treating nature badly.</td>
<td>48.4</td>
</tr>
<tr>
<td>9. People will someday know enough about how nature works to be able to control it.</td>
<td>19.5</td>
</tr>
<tr>
<td>10. If things don’t change, we will have a big disaster in the environment soon.</td>
<td>61.3</td>
</tr>
</tbody>
</table>

the earth while only 54.5% of the question 6 respondents strongly agreed or agreed that nature is strong enough to handle the effects of our modern lifestyle. The results of the
Table 3

*Frequency Distribution of the Experimental Group Pretest Responses (N=103)*

<table>
<thead>
<tr>
<th>Scale item</th>
<th>Strongly agree</th>
<th>Agree</th>
<th>Not sure</th>
<th>Disagree</th>
<th>Strongly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Plants and animals have as much right as people to live.</td>
<td>59.6</td>
<td>33.3</td>
<td>3.0</td>
<td>1.0</td>
<td>3.0</td>
</tr>
<tr>
<td>2. There are too many (or almost too many) people on earth.</td>
<td>33.3</td>
<td>33.3</td>
<td>12.7</td>
<td>10.8</td>
<td>9.8</td>
</tr>
<tr>
<td>3. People are clever enough to keep from ruining the earth.</td>
<td>29.0</td>
<td>24.0</td>
<td>18.0</td>
<td>15.0</td>
<td>14.0</td>
</tr>
<tr>
<td>4. People must still obey the laws of nature.</td>
<td>63.0</td>
<td>28.0</td>
<td>6.0</td>
<td>0</td>
<td>3.0</td>
</tr>
<tr>
<td>5. When people mess with nature it has bad results.</td>
<td>61.2</td>
<td>27.6</td>
<td>8.2</td>
<td>0</td>
<td>3.1</td>
</tr>
<tr>
<td>6. Nature is strong enough to handle the bad effects of our modern lifestyle.</td>
<td>24.8</td>
<td>29.7</td>
<td>14.9</td>
<td>19.8</td>
<td>10.9</td>
</tr>
<tr>
<td>7. People are supposed to rule over the rest of nature.</td>
<td>13.3</td>
<td>21.2</td>
<td>21.2</td>
<td>30.3</td>
<td>14.1</td>
</tr>
<tr>
<td>8. People are treating nature badly.</td>
<td>43.6</td>
<td>35.6</td>
<td>12.9</td>
<td>4.0</td>
<td>4.0</td>
</tr>
<tr>
<td>9. People will someday know enough about how nature works to be able to control it.</td>
<td>21.0</td>
<td>39.0</td>
<td>18.0</td>
<td>16.0</td>
<td>6.0</td>
</tr>
<tr>
<td>10. If things don’t change, we will have a big disaster in the environment soon.</td>
<td>57.0</td>
<td>33.0</td>
<td>7.0</td>
<td>1.0</td>
<td>2.0</td>
</tr>
</tbody>
</table>

remaining human exemptionalism question, question 9, had 60.0% strongly agree or agree that people will someday know enough about how nature works to be able to control it.
Table 4 shows a comparison between the control group’s and the experimental group’s mean pretest scores. There were 4 questions concerning the possibility of a catastrophic event known as an eco-crisis. A minimum score would be 4, the maximum would be 20, and a neutral opinion would be 12. A high score near 20 would indicate a strong concern that an eco-crisis may occur due to responses of “strongly agree”, while a low score close to 4 would indicate little concern that an eco-crisis might occur. Both the control group and experimental group had a mean of 16.34. The 3 questions concerning the rights of nature create a minimum score of 3, a maximum score of 15, and a neutral score of 9. The answers for question 9 were reverse scored to adjust for this negatively worded question. A high score near 15 would indicate a pro rights of nature attitude with responses strongly agreeing to the rights of nature, while a low score close to 3 would indicate an anti rights of nature attitude. The control group mean of 12.40 shows that respondents felt stronger about the rights of nature than the experimental group, which had a mean of 11.85. The control group also felt stronger about the human exemptionalism questions. Questions 3, 6, and 9 were all reverse scored to adjust for these negatively worded questions. Once adjusted, the minimum for these 3 questions was also 3, the maximum was 15, and a neutral opinion would be 9. The control group mean was 8.09, while the experimental group mean was 7.80, for the questions on human exemptionalism. The low scores here indicate either an attitude that humans need to change the way they use the earth’s resources, or that the negatively worded questions confused the respondents. For the control group, the 3-question mean of 12.40 for the rights of nature questions and the mean of 8.09 for the negatively worded human exemptionalism questions creates a 4.31 difference in the sums. It is difficult to determine the cause of this 1.44 difference per question, but it is noteworthy.
Table 4

Comparison of Mean Control and Experimental Pretest Scores

<table>
<thead>
<tr>
<th>Factor</th>
<th>Control\textsuperscript{a}</th>
<th>Experimental\textsuperscript{b}</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>\textit{M}</td>
<td>\textit{SD}</td>
</tr>
<tr>
<td>Rights of nature</td>
<td>12.40</td>
<td>1.87</td>
</tr>
<tr>
<td>Eco-crisis</td>
<td>16.34</td>
<td>2.99</td>
</tr>
<tr>
<td>Human exemptionalism</td>
<td>8.09</td>
<td>2.88</td>
</tr>
<tr>
<td>Total score for scale</td>
<td>36.83</td>
<td>4.88</td>
</tr>
</tbody>
</table>

\textsuperscript{a}n = 156. \textsuperscript{b}n = 103.

**Posttest Results**

Table 5 displays the distribution of the control group’s responses to the 10-item New Ecological Paradigm Scale for Children posttest. Questions 1, 4, and 7 covered the rights of nature, and the control group felt that people do not have the right to use earth in any way they please. Question 1 had 95.6% of the respondents strongly agreed or agreed that plants and animals have the same right to live as humans, while 95.6% of the respondents to question 4 strongly agreed or agreed that people must obey the laws of nature. Question 7 was negatively worded, and 55.6% strongly disagreed or disagreed that people are supposed to rule over the rest of nature. The responses to the eco-crisis questions that target the possibility of a catastrophic event also showed some strong opinions in response to questions 2, 5, 8, and 10. Question 2 had 63.3% of the respondents strongly agree or agree that there are too many or almost too many people on earth, while 90.0% of the question 5 respondents felt bad results occur when people mess with nature. Of the question 8 respondents, 83.3% strongly agreed or agreed that people are treating nature badly, while 86.7% of the question
Table 5

*Frequency Distribution of the Control Group Posttest Responses (N = 91)*

<table>
<thead>
<tr>
<th>Scale item</th>
<th>Responses (% surveyed)</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Plants and animals have as much right as people to live.</td>
<td>80.0</td>
<td>15.6</td>
<td>1.1</td>
<td>2.2</td>
<td>1.1</td>
</tr>
<tr>
<td>2. There are too many (or almost too many) people on earth.</td>
<td>33.3</td>
<td>30.0</td>
<td>16.7</td>
<td>13.3</td>
<td>6.7</td>
</tr>
<tr>
<td>3. People are clever enough to keep from ruining the earth.</td>
<td>34.4</td>
<td>25.6</td>
<td>11.1</td>
<td>16.7</td>
<td>12.2</td>
</tr>
<tr>
<td>4. People must still obey the laws of nature.</td>
<td>57.8</td>
<td>37.8</td>
<td>2.2</td>
<td>1.1</td>
<td>1.1</td>
</tr>
<tr>
<td>5. When people mess with nature it has bad results.</td>
<td>52.2</td>
<td>37.8</td>
<td>5.6</td>
<td>2.2</td>
<td>2.2</td>
</tr>
<tr>
<td>6. Nature is strong enough to handle the bad effects of our modern lifestyle.</td>
<td>15.9</td>
<td>19.3</td>
<td>20.5</td>
<td>28.4</td>
<td>15.9</td>
</tr>
<tr>
<td>7. People are supposed to rule over the rest of nature.</td>
<td>8.9</td>
<td>16.7</td>
<td>18.9</td>
<td>40.0</td>
<td>15.6</td>
</tr>
<tr>
<td>8. People are treating nature badly.</td>
<td>50.0</td>
<td>33.3</td>
<td>4.4</td>
<td>10.0</td>
<td>2.2</td>
</tr>
<tr>
<td>9. People will someday know enough about how nature works to be able to control it.</td>
<td>16.9</td>
<td>25.8</td>
<td>14.6</td>
<td>24.7</td>
<td>18.0</td>
</tr>
<tr>
<td>10. If things don’t change, we will have a big disaster in the environment soon.</td>
<td>60.0</td>
<td>26.7</td>
<td>7.8</td>
<td>4.4</td>
<td>1.1</td>
</tr>
</tbody>
</table>

10 respondents strongly agreed or agreed that we will have a big disaster in the environment soon if things don’t change. The human exceptionalism questions, numbered 3, 6, and 9, cover the idea that humans differ from other species and are exempt from the constraints of
nature. Respondents did not feel as strong about these items as they did the rights of nature and eco-crisis questions. Only 60.0% strongly agreed or agreed to question 3 that people are clever enough to keep from ruining the earth, while only 44.3% of the question 6 respondents strongly disagreed or disagreed that nature is strong enough to handle the effects of our modern lifestyle. The results of the remaining human exemptionalism question, question 9, had only 42.7% strongly agree or agree that people will someday know enough about how nature works to be able to control it.

Table 6 displays the distribution of the experimental group’s responses to the same pretest. The rights of nature questions, numbered 1, 4, and 7, showed that the experimental group does not feel that people have the right to use earth in any way they please. Question 1 had 88.8% of the respondents strongly agreed or agreed that plants and animals have the same right to live as humans, while 97.4% of the respondents to question 4 strongly agreed or agreed that people must obey the laws of nature. Question 7 was negatively worded, and only 41.5% strongly disagreed or disagreed that people are supposed to rule over the rest of nature. The responses to the eco-crisis questions also showed some strong opinions in the responses to questions 2, 5, 8, and 10. Question 2 had 61.8% of the respondents strongly agree or agree that earth is becoming overpopulated, while 83.2% of the question 5 respondents agreed or strongly agreed that bad results occur when people mess with nature. Of the respondents to question 8, 75.3% of respondents strongly agreed or agreed that people are treating nature badly, while 92.1% of the question 10 respondents strongly agreed or agreed that we will have a big disaster in the environment soon if things don’t change. The human exemptionalism questions, numbered 3, 6, and 9, cover the idea that humans differ from other species and are exempt from the constraints of nature. Respondents did not feel
as strong about these items as they did the rights of nature and eco-crisis questions. Only 53.0% strongly agreed or agreed to question 3 that people are clever enough to keep from ruining the earth, while only 54.5% of the question 6 respondents strongly agreed or agreed that nature is strong enough to handle the effects of our modern lifestyle. The results of the remaining human exemptionalism question, question 9, had 60.0% strongly agree or agree that people will someday know enough about how nature works to be able to control it.

Table 7 shows a comparison between the control group’s and the experimental group’s mean posttest scores. There were 4 questions concerning the possibility of a catastrophic event known as an eco-crisis. A minimum score would be 4, the maximum would be 20, and a neutral opinion would be 12. A high score near 20 would indicate a strong concern that an eco-crisis may occur due to responses of strongly agree, while a low score close to 4 would indicate little concern that an eco-crisis might occur. The control group had a mean of 16.67 and experimental group had a mean of 16.37. The 3 questions concerning the rights of nature create a minimum score of 3, a maximum score of 15, and a neutral score of 9. The answers for question 9 were reverse scored to adjust for this negatively worded question. A high score near 15 would indicate a pro rights of nature attitude where responses strongly agreed to the rights of nature, while a low score close to 3 would indicate an anti rights of nature attitude. The control group mean of 12.59 shows that they felt stronger about the rights of nature than did the experimental group, which had a mean of 12.09. The control group also felt stronger about the human exemptionalism questions. Questions 3, 6, and 9 were all reverse scored to adjust for these negatively worded questions. Once adjusted, the minimum for these 3 questions was also 3, the maximum was
15, and a neutral opinion would be 9. The control group mean was 8.68, while the experimental group mean was 7.37

Table 6

*Frequency Distribution of the Experimental Group Posttest Responses (N = 90)*

<table>
<thead>
<tr>
<th>Scale item</th>
<th>Responses (% surveyed)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Strongly agree</td>
</tr>
<tr>
<td>1. Plants and animals have as much right as people to live.</td>
<td>61.8</td>
</tr>
<tr>
<td>2. There are too many (or almost too many) people on earth.</td>
<td>32.6</td>
</tr>
<tr>
<td>3. People are clever enough to keep from ruining the earth.</td>
<td>33.7</td>
</tr>
<tr>
<td>4. People must still obey the laws of nature.</td>
<td>60.7</td>
</tr>
<tr>
<td>5. When people mess with nature it has bad results.</td>
<td>50.6</td>
</tr>
<tr>
<td>6. Nature is strong enough to handle the bad effects of our modern lifestyle.</td>
<td>22.5</td>
</tr>
<tr>
<td>7. People are supposed to rule over the rest of nature.</td>
<td>6.7</td>
</tr>
<tr>
<td>8. People are treating nature badly.</td>
<td>41.6</td>
</tr>
<tr>
<td>9. People will someday know enough about how nature works to be able to control it.</td>
<td>18.0</td>
</tr>
<tr>
<td>10. If things don’t change, we will have a big disaster in the environment soon.</td>
<td>57.3</td>
</tr>
</tbody>
</table>
for the questions on human exemptionalism. The low scores here indicate either an attitude that humans need to change the way they use the earth’s resources, or that the negatively worded questions confused the respondents when answering. For the control group, the 3-question mean of 12.59 for the rights of nature questions and the mean of 8.68 for the negatively worded human exemptionalism questions creates a 3.91 difference in sums. Although there is no way to determine if the cause of this 1.30 difference per question is the negative wording or a strong view towards human exemptionalism, it is worth noting this large difference in responses versus the other 7 questions.

Table 7

*Comparison of Control and Experimental Posttest Individual Scale and Total Scale Mean Scores*

<table>
<thead>
<tr>
<th>Factor</th>
<th>Control(^a) M</th>
<th>SD</th>
<th>Experimental(^b) M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rights of nature</td>
<td>12.59</td>
<td>1.76</td>
<td>12.09</td>
<td>1.95</td>
</tr>
<tr>
<td>Eco-crisis</td>
<td>16.67</td>
<td>2.96</td>
<td>16.37</td>
<td>2.80</td>
</tr>
<tr>
<td>Human exemptionalism</td>
<td>8.68</td>
<td>2.88</td>
<td>7.37</td>
<td>2.43</td>
</tr>
<tr>
<td>Total score for scale</td>
<td>37.95</td>
<td>4.46</td>
<td>35.82</td>
<td>4.41</td>
</tr>
</tbody>
</table>

\(^a\)n = 91. \(^b\)n = 90.

**Comparing Pretest and Posttest Results**

Table 8 shows a comparison between the experimental group’s mean pretest and posttest scores for the individual scales and the total scale. The scores for rights of nature, for human exemptionalism, and for the total score all went down between the pretest and posttest in spite of the fact that training occurred, while the eco crisis scores did increase slightly. Assumption number four stated that pretest scores are
not so large as to not have room for increase; however, this assumption appears to be questionable for a few of the questions. The pretest responses for questions 1, 4, 5, and 10 in Table 3 were concentrated in the responses strongly agree and agree; however, the agree responses could have increased to strongly agree. As a result, the assumption was not violated, and there is room for increase. The responses for rights of nature questions went down 0.31, from 12.40 to 12.09, and the responses for human exceptionalism went down 0.72, from 8.09 to 7.37. The eco-crisis questions increased 0.03, from 16.34 to 16.37, while the total score decreased 1.01, from 36.83 to 35.82.

Table 8

*Comparison of Pretest and Posttest Experimental Group Individual Scale and Total Scale Mean Scores*

<table>
<thead>
<tr>
<th>Factor</th>
<th>Pretest&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Posttest&lt;sup&gt;b&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&lt;i&gt;M&lt;/i&gt;</td>
<td>&lt;i&gt;SD&lt;/i&gt;</td>
</tr>
<tr>
<td>Rights of nature</td>
<td>12.40</td>
<td>1.87</td>
</tr>
<tr>
<td>Eco-crisis</td>
<td>16.34</td>
<td>2.99</td>
</tr>
<tr>
<td>Human exceptionalism</td>
<td>8.09</td>
<td>2.88</td>
</tr>
<tr>
<td>Total score for scale</td>
<td>36.83</td>
<td>4.88</td>
</tr>
</tbody>
</table>

<sup>a</sup><i>n</i> = 103. <sup>b</sup><i>n</i> = 90.

Table 9 shows a comparison between the control group’s mean pretest and posttest scores for the individual scales and the total scale. The scores for rights of nature, eco-crisis, and human exceptionalism and the total score, all went up between the pretest and posttest even though there was no training. The responses for rights of
nature questions went up 0.74, from 11.85 to 12.59, and the responses for eco-crisis questions went up 0.33, from 16.34 to 16.67. The human exemptionalism responses went up 0.88, from 7.80 to 8.68, and the total score increased 1.96, from 35.99 to 37.95. These increases may have occurred for a variety of reasons, including familiarity with the questions, answering with socially desirable responses, or as a result of the earthquake in Japan and the subsequent damages that ensued. These factors may have influenced the control group; however, they also would have influenced the experimental group and therefore they should have affected both groups equally.

Table 9

Comparison of Pretest and Posttest Control Group Individual Scale and Total Scale Mean Scores

<table>
<thead>
<tr>
<th>Factor</th>
<th>Pretest(^a)</th>
<th>Posttest(^b)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(M)</td>
<td>(SD)</td>
</tr>
<tr>
<td>Rights of nature</td>
<td>11.85</td>
<td>2.04</td>
</tr>
<tr>
<td>Eco-crisis</td>
<td>16.34</td>
<td>3.04</td>
</tr>
<tr>
<td>Human exemptionalism</td>
<td>7.80</td>
<td>3.19</td>
</tr>
<tr>
<td>Total score for scale</td>
<td>35.99</td>
<td>4.70</td>
</tr>
</tbody>
</table>

\(^a\)n = 156. \(^b\)n = 91.
Hypotheses

First Research Hypothesis

H_01: The scores reflecting the attitudes and beliefs of hotel housekeepers concerning the environment will increase as a result of environmental training.

The following survey items were listed in the same order on both the control and experimental pretests and posttests.

1. Plants and animals have as much right as people to live.
2. There are too many (or almost too many) people on earth.
3. People are clever enough to keep from ruining the earth.
4. People must still obey the laws of nature.
5. When people mess with nature it has bad results.
6. Nature is strong enough to handle the bad effects of our modern lifestyle.
7. People are supposed to rule over the rest of nature.
8. People are treating nature badly.
9. People will someday know enough about how nature works to be able to control it.
10. If things don’t change, we will have a big disaster in the environment soon.

Possible responses to these survey items reflecting the housekeeping employees’ attitudes and behaviors ranged from 1 (strongly disagree) to 5 (strongly agree) on a Likert-type scale. The scoring for the negatively worded items (3, 6, 7, and 9) was reversed (1 = strongly agree to 5 = strongly disagree).

First research hypothesis scale scores. The total score for the scale ranged from a possible low of 10, if a respondent answered with a 1 to every item, to a high of 50, if a respondent answered with a 5 to every item. A lower score (closer to 10) indicates support
for the theory that nature exists solely to serve human needs and that humans should be able to use the earth’s resources in any way they want; that humans do not need to make changes to their ways and that the balance between humans and nature is satisfactory at this time. A score around the midpoint of 30 can be interpreted as neutral with regard to whether one believes that nature exists solely to serve human needs. A higher score (close to 50) indicates endorsement of the theory that nature does not exist solely to serve human needs, and that changes should occur to create more balance between humans and nature. This theory reflects the belief that humans are using the earth’s resources at a faster rate than the resources can be replenished, and that this rate of consumption cannot continue.

**First research hypothesis results.** The first research hypothesis stated that the scores reflecting the attitudes and beliefs of hotel housekeepers who receive environmental education will increase as a result of environmental training. The pretest responses for this scale were treated as the time 1 group and the posttest responses as the time 2 group (with group as a main effect), and each respondent was nested within a specific hotel. The other main effect tested was the experimental condition (treatment vs. control), and the interaction between hotel and treatment was tested.

The results did not confirm this research hypothesis. A 2 x 2 mixed design ANOVA tested for differences in the total scores due to the experimental condition (treatment vs. control) and time (pretraining or posttraining). The analysis revealed that neither the main effect of the experimental condition, $F(1, 25.776) = 3.567$, nor the main effect of time, $F(1,430.812) = 1.42, p = .23$ was significant for this scale. The condition x time interaction was also not significant, $F(1,430.812) = 2.291, p = .13$. This means that the “condition”
(either treatment or control) and “time” (pretest or posttest) were not important predictors of the dependent variable total.

The pretest results for the experimental and control groups were 36.007 and 36.862, respectively. Both groups were very similar in their responses, and this would appear to be accurate as no condition had been applied prior to the pretest that would have caused one group’s responses to differ from the responses of the other group. The survey was administered as if given to any population of people, and many in the experimental group did not realize that they would be doing anything different after the survey.

The posttest results for the experimental and control groups were 38.050 and 35.865, respectively, for this scale. The score for the experimental group went up 1.118, from 36.862 to 38.050, meaning that their beliefs moved closer to the theory that nature does not exist solely to serve human needs and that humans are using the earth’s resources at a faster rate than the resources can be replenished. This confirms the goal of the environmental training. The score for the control group went down 0.142, from 36.007 to 35.865, meaning that their beliefs moved closer to the theory that man should be able to use the earth’s resources in any way the he wants because the balance between man and nature is satisfactory at this time.

**Second Research Hypothesis**

**H02:** The scores reflecting the combined attitudes and beliefs of hotel housekeepers concerning rights of nature will increase as a result of environmental training.

This research hypothesis predicts that scores reflecting the attitudes and beliefs of housekeepers will increase in regards to the rights of animals and plants to live, the laws of nature, and people ruling over the rest of nature. The scores for these aggregated items should increase from their pretraining levels as a result of the environmental training. Item 7
“People are supposed to rule over the rest of nature” was negatively worded and needed to be reverse scored (e.g., strongly agree = 1 instead of 5).

The following pretest and posttest items were listed as numbers 1, 4, and 7 on both the control and experimental surveys.

1. Plants and animals have as much right as people to live.
2. People must still obey the laws of nature.
3. People are supposed to rule over the rest of nature.

**Second research hypothesis scale.** The total scale score ranged from a possible low of 3, if a respondent answered with a 1 to every item, to a high of 15, if a respondent answered with a 5 to every item. A lower score (closer to 3) supports the theory that nature exists solely to serve human needs and that humans should be able to use the earth’s resources in any way they want; that humans do not need to make changes to their ways, and the balance between humans and nature is satisfactory at this time. A score around the midpoint of 9 can be interpreted as neutral with regard to whether one believes that nature exists solely to serve human needs. A higher score (close to 15) indicates endorsement of the theory that nature does not exist solely to serve human needs, and that changes should occur to create more balance between humans and nature. This theory reflects the beliefs that humans are using the earth’s resources at a faster rate than the resources can be replenished, and that this rate of consumption cannot continue.

**Second research hypothesis results.** The pretest responses for this subscale were treated as the time 1 group and the posttest responses as the time 2 group (with group as a main effect), and each respondent was nested within a specific hotel. The other main effect
tested was the experimental condition (treatment vs. control), and finally, the interaction between hotel and treatment was tested.

This research hypothesis predicted that the score for hotel housekeepers on the items related to rights of nature would increase, indicating a belief that nature does not exist solely to serve human needs. The results did not confirm this prediction. A 2 x 2 mixed design ANOVA tested for differences in the total scores due to the experimental condition (treatment vs. control) and time (pretraining or posttraining). The analysis revealed that neither the main effect of experimental condition, $F(1,25.589) = 0.012, p = .91$, nor the main effect of time, $F(1,20.132) = 0.062, p = .806$ was significant for this subscale. The condition x time interaction was also not significant, $F(1,20.132) = 0.003, p = .954$. This means that the “condition” (either treatment or control) and “time” (pretest or posttest) were not important predictors of the dependent variable total.

The pretest results for the experimental and control groups were 11.830 and 11.803, respectively, for this subscale. Both groups were very similar in their responses, and this would appear to be accurate as no condition had been applied prior to the pretest that would have caused one group’s responses to differ from the responses of the other group. The survey was administered as if given to any population of people, and many in the experimental group did not realize that they would be doing anything special after the survey.

The posttest results for the experimental and control groups were 11.889 and 11.840, respectively, for this subscale. The score for the experimental group went up 0.59, from 11.830 to 11.889, meaning that their beliefs moved closer to the theory that nature does not exist solely to serve human needs, and that humans are using the earth’s resources at a faster rate than the resources can be replenished. This confirms the goal of the environmental
training but did not prove to be a significant change. The score for the control group went up 0.37, from 11.803 to 11.840, meaning that their beliefs also moved closer to the theory that that nature does not exist solely to serve human needs and that humans are using the earth’s resources at a faster rate than the resources can be replenished.

**Third Research Hypothesis**

**H₃3:** The scores reflecting the combined attitudes and beliefs of hotel housekeepers concerning an ecological crisis will increase as a result of environmental training.

Some believe that the actions of society could cause an eco-crisis. Four survey items—concerning the number of people on earth, people messing with nature, treating nature badly, and the potential for a big disaster in the environment—were used to measure attitudes and beliefs regarding an eco-crisis.

The following survey items were included in both the control and experimental pretests and posttests.

2. There are too many (or almost too many) people on earth.

5. When people mess with nature it has bad results.

8. People are treating nature badly.

10. If things don’t change, we will have a big disaster in the environment soon.

The environmental training should have caused an increase in the scores reflecting the attitudes and beliefs of the housekeepers in the experimental group.

**The third hypothesis scale.** The total scale score ranged from a possible low of 4, if a respondent answered with a 1 to every item, to a high of 20, if a respondent answered with a 5 to every item. A lower score (closer to 4) indicates support for the theory that nature exists solely to serve human needs and that humans should be able to use the earth’s
resources in any way they want; that humans do not need to make changes to their ways, and the balance between man and nature is satisfactory at this time. A score around the midpoint of 12 can be interpreted as neutral with regard to whether one believes that nature exists solely to serve human needs. A higher score, that is, close to 20, indicates endorsement of the theory that nature does not exist solely to serve human needs and that changes should occur to create more balance between man and nature. This theory reflects the beliefs that humans are using the earth’s resources at a faster rate than the resources can be replenished, and that this rate of consumption cannot continue.

**Third research hypothesis results.** The pretest responses for this subscale were treated as the time 1 group and the posttest responses as the time 2 group (with group as a main effect), and each respondent was nested within a specific hotel. The other main effect tested was the experimental condition (treatment vs. control), and finally, the interaction between hotel and treatment was tested.

This research hypothesis predicted that the score for hotel housekeepers on the items related to an eco-crisis would increase, indicating a belief that nature does not exist solely to serve human needs. The results did not confirm this prediction. A 2 x 2 mixed design ANOVA tested for differences in the total scores due to the experimental condition (treatment vs. control) and time (pretraining or posttraining). The analysis revealed that neither the main effect of experimental condition, $F(1,26.523) = 0.105, p = .748$, nor the main effect of time, $F(1,23.000) = 0.007, p = .933$ was significant for this subscale. The condition x time interaction was also not significant, $F(1,23) = 0.393, p = .537$. This means that the “condition” (either treatment or control), and “time” (pretest or posttest) are not important predictors of the dependent variable total.
The pretest results for the experimental and control groups were 16.258 and 16.710, respectively, for this subscale. Both groups were very similar in their responses, although the control group’s scores were higher. Similar responses would appear to be accurate as no condition had been applied prior to the pretest that would have caused one group’s responses to differ from the responses of the other group. The pretest was administered as if given to any population of people, and many in the experimental group did not realize that they would be doing anything special after the survey.

The posttest survey results for the experimental and control groups were 16.486 and 16.411, respectively, for this subscale. The score for the experimental group went up 0.228, from 16.258 to 16.486, meaning that their beliefs moved closer to the theory that nature does not exist solely to serve human needs and that humans are using the earth’s resources at a faster rate than the resources can be replenished. This confirms the goal of the environmental training, but did not prove to be a significant change. The score for the control group went down 0.299, from 16.710 to 16.411, meaning that their beliefs also moved closer to the theory that nature does not exist solely to serve human needs and that humans are using the earth’s resources at a faster rate than the resources can be replenished.

**Fourth Research Hypothesis**

**H₄**: The scores reflecting the combined attitudes and beliefs of hotel housekeepers concerning human exemptionalism will increase as a result of environmental training.

Actions by humans have an effect on the environment; however some believe that these actions do not have a major impact on the environment, that the actions of humans will not cause an ecological crisis and/or that, as technology develops, the impact on the environment will become less of an issue. Three survey items (numbers 3, 6, and 9) on the
control group’s and experimental group’s pretests and posttests measured if ruining the earth can be avoided, if nature can handle the damage humans are causing, and if humans will become able to control nature with increased knowledge:

3. People are clever enough to keep from ruining the earth.

6. Nature is strong enough to handle the bad effects of our modern lifestyle.

9. People will someday know enough about how nature works to be able to control it.

These items are negatively worded and needed to be reverse scored to show that more positive responses indicated a positive change in housekeeper attitudes and beliefs.

**Fourth research hypothesis scale.** The total scale score ranged from a possible low of 3, if a respondent answered with a 1 to every item, to a high of 15, if every respondent answered with a 5 to every item. A lower score (closer to 3) indicates support for the theory that nature exists solely to serve human needs, that humans should be able to use the earth’s resources in any way they want; that humans do not need to make changes to their ways, and the balance between humans and nature is satisfactory at this time. A score around the midpoint of 9 can be interpreted as neutral with regard to whether one believes that nature exists solely to serve human needs. A higher score (close to 15) indicates endorsement of the theory that nature does not exist solely to serve human needs and that changes should occur to create more balance between humans and nature. This theory reflects the beliefs that humans are using the earth’s resources at a faster rate than the resources can be replenished, and that this rate of consumption cannot continue.

**The fourth hypothesis results.** The pretest responses for this subscale were treated as the time 1 group and the posttest responses as the time 2 group (with group as a main effect), and each respondent was nested within a specific hotel. The other main effect tested
was the experimental condition (treatment vs. control), and finally, the interaction between hotel and treatment was tested.

This research hypothesis predicted that the score for hotel housekeepers on the items related to an ecological crisis would increase, indicating a belief that nature does not exist solely to serve human needs. The results did not confirm this prediction. A 2 x 2 mixed design ANOVA tested for differences in the total scores due to the experimental condition (treatment vs. control) and time (pretraining or posttraining). The analysis revealed that neither the main effect of experimental condition, $F(1,26.371) = 1.957, p = .173$, nor the main effect of time $F(1,21.428) = 0.202, p = .658$, was significant for this subscale. The condition x time interaction was also not significant, $F(1,21.428) = 2.404, p = .136$. This means that the “condition” (either treatment or control) and “time” (pretest or posttest) are not important predictors of the dependent variable total.

The pretest results for the experimental and control groups were 9.853 and 10.133, respectively. Both groups were very similar in their responses, although the control group’s scores were higher. Similar responses would appear to be accurate as no condition had been applied prior to the pretest that would have caused one group’s responses to differ from the responses of the other group. The pretest was administered as if given to any population of people, and many in the experimental groups did not realize that they would be doing anything special after the survey.

The posttest survey results for the experimental and control groups were 9.099 and 10.548, respectively, for this subscale. The score for the experimental group went down 0.754, from 9.853 to 9.099. The items were negatively worded, and so the responses were reverse scored. A decrease in scores would mean that the respondents’ beliefs moved closer
to the theory that nature does not exist solely to serve human needs, and that humans using the earth’s resources at a faster rate than the resources can be replenished. This confirms the goal of the environmental training, but did not prove to be a significant change. The score for the control group went down 0.299, from 16.710 to 16.411, meaning that their beliefs also moved closer to the theory that nature does not exist solely to serve human needs, and that man is using the earth’s resources at a faster rate than the resources can be replenished.
CHAPTER 5. SUMMARY AND DISCUSSION

This chapter provides an interpretation of the results of this study, implications of the findings, limitations of the study, and future directions.

Introduction

The environmental attitudes and behaviors of hotel housekeepers were measured according to time (pre- and post-) and condition (treatment and control) using the New Ecological Paradigm scale (Manoli et al., 2007). The study was conducted at 28 hotels in Maryland, Virginia and the District of Columbia with a minimum of 60 days used as the time. This extended period was used to see if a significant long-term change in attitudes and behaviors occurred. Although changes occurred in the experimental group, these changes were not large enough to be considered significant.

Summary

The results of the study did not show a significant change in support of any of the four research hypotheses. The total score for the 10 items on the survey did not show a significant change for either the control or experimental groups from the pretest to the posttest. Changes recognized in the experimental group under all four research hypotheses showed a trend toward a more environmentally friendly attitude, however the changes were not significant.

The analysis for the first research hypothesis included a sum of the scores for all 10 items concerning environmental attitudes and behaviors. The pretest items and posttest items were listed in the same order on both the control group and experimental group surveys. Items numbered 3, 6, 7, and 9 were written so that agreement would indicate an anti-
ecological view. The responses to these items were reverse scored so that a more positive response to all 10 items indicated a more pro-ecological view. Although changes occurred in the scores of both the treatment group and the control group for this research hypothesis, which showed a change toward a more environmentally friendly attitude, the change was not large enough to be considered significant.

The items relating to the second research hypothesis on both the pretests and posttests were listed as numbers 1, 4, and 7 on both the control group and experimental group surveys. Item 7 was worded so that agreement would indicate an anti-ecological view. The responses to this item were reverse scored so that a more positive response to the items indicated a more pro-ecological view. Responses to the items indicated agreement or disagreement with the statements if plants and animals have as much right as people to live, if people must still obey the laws of nature, and if people are supposed to rule over the rest of nature. Although changes were recognized in the scores of both the treatment group and the control group for this research hypothesis, which showed a change toward a more environmentally friendly attitude, the change was not large enough to be considered significant.

The items relating to the third research hypothesis on both the pretests and posttests were listed as numbers 2, 5, 8, and 10 on both the control group and experimental group surveys. These items asked if there are too many (or almost too many) people on earth, when people mess with nature it has bad results, if people are treating nature badly, and if things don't change, we will have a big disaster in the environment soon. Although changes were seen in the scores of experimental treatment groups for the items related to this hypothesis, which showed a change toward a more environmentally friendly attitude, the change was not large enough to be considered significant. Changes in the scores of the
control group for this hypothesis showed a change toward a less environmentally friendly attitude, but this change was not large enough to be considered significant.

The items relating to the fourth research hypothesis on both the pretests and posttests were listed as numbers 3, 6, and 9 on both the control group and experimental group surveys. Items 3, 6, and 9 were worded so that agreement would indicate an anti-ecological view. In order to have the positive responses of strongly agree and agree indicate a more pro-ecological view, these items were reverse scored. Responses to these items indicated agreement or disagreement with whether people are clever enough to keep from ruining the earth, whether nature is strong enough to handle the bad effects of our modern lifestyle, and if people will someday know enough about how nature works to be able to control it. Although changes were recognized in the scores of both the treatment group and the control group for the items related to this hypothesis, which showed a change toward a more environmentally friendly attitude, the change was not large enough to be considered significant.

**Limitations**

**Environmental Disasters**

This study was conducted with a pre- and posttest and a control and experimental group. The posttest responses from the control group were not expected to change from the pretest responses, however a significant ecological event occurred. An earthquake that measured 8.9 on the Richter Scale occurred on March 11, 2011 (Harlan, 2011) prior to administering the posttest. Subsequent damage from the earthquake and an ensuing tsunami caused radiation leaks from a nuclear reactor in Fukushima, Japan. These reactor leaks caused citizens throughout the world to have concern about radiation leaks. As a result,
officials in the United States from the Centers for Disease Control and Prevention, the Food and Drug Administration and the Environmental Protection Agency issued a joint statement that the amount of radiation released by the damaged reactors was so small, there was no chance it would cause disease (Brown, 2011).

Although statements such as these are used to assure citizens that no problems exist, the literature on disasters shows that events such as these are traumatic for those who are directly impacted by the disaster as well as for people in the general population who witness the disaster on television or newspapers or other media (Neria, Nandi, & Galea, 2008). In particular Schlenger et al. (2002) and Silver, Holman, McIntosh, Poulin, & Gil-Rivas (2002) found that the 9/11 terrorist attacks in New York City were found to have an effect on national samples studied. Pfefferbaum et al. (1999) also found evidence of a possible relationship between indirect exposure and trauma in areas distant from a disaster during their study of the 1995 Oklahoma City bombing. In particular, these studies showed a link between indirect exposure to disasters and post traumatic stress disorder (PTSD). Although many conditions such as PTSD, major depression disorder, generalized anxiety disorder, and panic disorder have been observed in the literature, PTSD is the most frequently assessed and observed of all psychopathology following a disaster, according to a number of studies (Galea, Nandi, & Vlahov, 2005; Norris et al., 2002). Several studies acknowledge that the frequency of PTSD in the directly impacted victims and rescue workers are far greater than in the general population (Neria et al., 2006, 2008; Schlenger et al., 2002), however the presence of PTSD in the general population has been documented in the literature on disasters.
Although the psychological effect of a natural disaster is not within the realm of this study, the control group attitudes should have remained relatively constant over time. A significant change in control group attitudes could have been effected by the natural disaster and ensuing events in Japan, which previous research by Arcury and Christianson (1990) supports. Their study found a significant increase in pro-new environmental paradigm responses from Kentucky residents in counties that suffered through water restrictions after a severe summer drought. A six-item version of the New Environmental Paradigm Scale was used in 1984 to sample residents statewide, and a subsequent survey was administered in 1988. Arcury and Christianson concluded from these changes that a “critical environmental experience can accelerate change in environmental worldview” (p. 404), however there is no evidence to support that a change occurred in this housekeeping study.

**Informed Consent Form**

It is possible that some responses may have been different in both the control and experimental groups due to the informed consent form. Prior to taking the survey, participants were given an informed consent form to sign stating they agreed to take part in the study. The informed consent form stated, “You may also be selected to take part in an environmental training session that will be held immediately after the first survey and will take approximately 30 minutes.” An employee who questioned the survey administrator concerning the environmental training may have been positively or negatively influenced by the administrator’s response.

The employees’ reaction to the survey items may have been positively influenced by the possibility of participating in the environmental training. Some employees may have been curious about the environmental training, and their survey responses may have been
positive when told they would be a participant. Employees who did not want to take part in the environmental training may have been positively influenced when they discovered that they would not take part in the training. These employees may have wanted to start working immediately, and they have become pleased that the training would not interrupt their routine.

Employees may have reacted negatively to the survey items based upon their participation in the environmental training. Employees may have wanted to take part in the environmental training, and their survey responses may have been influenced negatively when told they would not be a participant in the training. Resentful demoralization threatens internal validity, and individuals in the control group “may [have] become resentful and demoralized because they perceive[d] that they receive[d] a less desirable treatment than other groups” (Creswell, 2008, p. 309). Employees who did not want to take part in the environmental training may have been negatively influenced when they discovered that they would have to take part in the training. These employees may have wanted to start working immediately, and may have become disappointed that the training would interrupt their routine.

Sample

There are a variety of reasons why there was not a significant change in the attitudes and beliefs of the sample surveyed. The surveys and training were conducted in the morning prior to work. In two hotels the employees did not want to participate in the training because the training would keep them from cleaning rooms, and they were worried about making their quota of rooms cleaned for the day. Language was also an issue as English was the second language for many of the participants. A Spanish translation of the survey was
available, and 134 of the 440 responses used the Spanish translation. Translations into
languages not as common as Spanish could also have been provided. For example, Egyptian
employees were required to take the survey in English rather than Arabic. Other employees
from Haiti, the Philippines, and China were not able to take the survey in their native
language and asked for translation assistance on some words. The translation of words such
as “ruining” in item 3 may have influenced how the employee responded to that item. In
some cases, the employees did not understand the informed consent letter and wanted to take
it home for translation by someone they trusted. The training was scheduled to occur on that
day, and the employee elected to not sign the voluntary informed consent form. Other
employees elected to sign the informed consent but asked that a bilingual employee translate
the training exercise. The translation may not have been accurate or the words used in
translation may not have been understood. Concern about the environment may have been
an issue as research has shown that demographics can affect environmental concern. This
was evident in many surveys as 5 was circled for every response, and multiple surveys at the
same hotel had the same response for all 10 items.

Upper Management Support

The survey was approved and supported at the corporate level, but the individual
properties did not always support the survey and training. There were 31 hotels selected to
participate in the study, but only 22 hotels participated in both the pre and post surveys. The
remaining nine hotels either did not return the first or second survey after being contacted
numerous times. The General Manager at each hotel was given a date when the hotel would
be visited by email prior to both surveys. Although many General Managers advised their
staffs of the visit, many housekeeping staffs were not prepared for the training or survey.
Some properties requested copies of the survey for the housekeeping manager to administer during the next morning staff meeting. The response was good from these hotels; however, quite a few hotels received emails, telephone calls, and return visits to remind them of the survey. The hotels where the General Manager supported the project eventually responded and returned completed surveys; however, there were 9 hotels where the General Manager did not respond to reminders and showed little support for the study. These General Managers did not return calls, stated the surveys were in the mail already, and in one case the General Manager asked to wait for a few months before administering the second survey. A lack of response showed a lack of concern for the study, and the environmental attitudes and behaviors of General Manager may have a direct effect on the environmental attitudes of the employees. A lack of upper management support for environmental programs can have both a positive and negative influence on the environmental attitudes and behaviors of their employees. The extent of this influence is a topic for future research.

**Recommendations For Future Research**

This study was a preliminary study and was the first of its kind to measure environmental attitudes and behavior of hotel housekeepers. As a result, it was difficult to correlate the findings of this study with other similar studies. A number of factors could influence an individual’s attitudes and behaviors concerning the environment, and environmental education is one way to influence employee attitudes and behaviors. The environmental training used in this study used hands on exercises; however, the Recycling Relay showed how to recycle, and may not have been effective in influencing attitudes and behaviors. Future environmental training that targets attitudes and behaviors should use exercises that influence attitudes. The exercise titled “How long does it take” was more
appropriate for influencing attitudes and behaviors. Knowing the length of time that an item takes to decompose can directly affect how a person feels about throwing that item into the trash and eventually the landfill. Similar exercises should be used in the future when trying to change attitudes and behaviors. A larger study with participants from different geographical locations is required in the future to gain a better understanding of environmental attitudes and behavior of hotel housekeepers. The study could be administered by the same individual prior to work to ensure that unanswered items are the result of not wanting to respond rather than a missed item. This method would help to obtain the maximum number of completed useable responses. An incentive for taking both surveys would increase responses, and provide an incentive for answering truthfully and without copying responses from others. The survey should be translated into Arabic, Chinese, and other appropriate languages spoken by the employees who are not fluent in English. The informed consent form needs to use simplified wording and be translated into Spanish, Arabic and Chinese. This study should be carried out in a larger geographical area within the United States to determine if geographical location has a role in determining environmental attitudes and behaviors. Social desirability scores should be created to eliminate the possibility that respondents chose socially desirable responses. Additionally, demographic questions should be used to determine if there are other variables that affected responses.

Although many hotels have appointed a recycling or environmental steward, many hotels still do not have any type of environmental program established. Most hotels do not have the financial resources to have a dedicated environmental representative so the head of housekeeping, engineering or human resources is usually given this added responsibility. In larger hotels where recycling and other forms of water and energy conservation can justify a
full time employee, there may be a dedicated environmental steward, but this is not common. From a policy standpoint, this person could also act as a trainer and data collector in order to determine the financial gains from their environmental effort. Future research could track the various incentives used in hotels to see which are most effective, and what financial savings result from implementing environmental policies. As previously mentioned, a survey of upper management, and in particular hotel general managers, could determine if the attitudes and behaviors of employees are influenced by upper management. In tracking upper management responses, responses from all departments, rather than just housekeeping, should be obtained. A clear understanding of upper management attitudes and behaviors will help to determine if employee attitudes and behaviors are cultural. Training housekeepers and other line employees may be futile if the hotel’s culture is not supportive of environmental actions.
APPENDIX A. CHRONOLOGY OF ENVIRONMENTAL MOVEMENT

1899 Rivers and Harbors Act Passed including Section 13 known as the Refuse Act
1962 Book Silent Spring by Rachel Carson is published
1970 First Earth Day held on April 22nd
1972 United Nations Conference on Human Environment (UNCHE) held in June
1978 New Environmental Paradigm created by Dunlap and Van Liere
1983 Brundtland Commission established by the United Nations
1987 Montreal Protocol established concerning CFC emissions
1987 Our Common Future (Bruntland Report) Published by World Commission on Environment and Development on March 20
1987 Mobro Barge incident
1989 Excise Tax established on ozone-depleting chemicals
1992 UN Conference on Environment and Development (UNCED) (Earth Summit) held in Rio de Janeiro from June 3-14
1993 International Hotels Environment Initiative (IHEI) launched
1993 Executive Order 12,845 required all federal government agencies to buy only Energy-Star qualified PCs, monitors, and printers.
1993 Executive Order No. 12,852 established U.S. President’s Council on Sustainable Development on June 29
1994 Green Globe created by World Travel and Tourism Environmental Research Centre’s (WTTC)
1994 Triple Bottom Line introduced by Elkington
1996 Indicators of Sustainable Development, Framework and Methodologies developed
1997 United Nations Framework Convention on Climate Change (UNFCCC) created the Kyoto Protocol
1997 Certification for Sustainable Tourism (CST) was created by the Costa Rican Ministry of Tourism
1998 Energy Star program expanded to include consumer electronics
2000 New Ecological Paradigm created by Dunlap, Van Liere, Mertig, & Jones
2000 LEED standards were formally put into place
2001 Indicators of Sustainable Development: Guidelines and Methodologies was published
2001 Executive Order 13,221 required government purchases have standby level of 1 watt or less
2002 World Summit on Sustainable Development (WSSD) in Johannesburg, (Rio +10)
2002 Cradle to Cradle by McDonough & Braungart published
2002 The European Union establishes the Integrated Pollution Prevention and Control (IPPC) Directive 96/61/CE
2003 Hilton International establishes Hilton Environmental Reporting (HER) system
2006 California passed Assembly Bill 32 (AB 32) Global Warming Solutions
APPENDIX B. NEW ENVIRONMENTAL PARADIGM SCALE ITEMS

(Dunlap & Van Liere, 1978)

1. We are approaching the limit of the number of people the earth can support.
2. The balance of nature is very delicate and easily upset.
3. Humans have the right to modify the natural environment.
4. Humankind was created to rule over the rest of nature.
5. When humans interfere with nature it often produces disastrous consequences.
6. Plants and animals exist primarily to be used by humans.
7. To maintain a healthy economy we will have to develop a “steady state” economy where industrial growth is controlled.
8. Humans must live in harmony with nature in order to survive.
9. The earth is like a spaceship with only limited room and resources.
10. Humans need not adapt to the natural environment because they can remake it to suit their needs.
11. There are limits to growth beyond which our industrialized society cannot expand.
12. Mankind is severely abusing the environment.
APPENDIX C. NEW ECOLOGICAL PARADIGM SCALE ITEMS

(Dunlap et al., 2000)

1. We are approaching the limit of the number of people the earth can support
2. Humans have the right to modify the natural environment to suit their needs
3. When humans interfere with nature it often produces disastrous consequences
4. Human ingenuity will insure that we do NOT make the earth unlivable
5. Humans are severely abusing the environment
6. The earth has plenty of natural resources if we just learn how to develop them
7. Plants and animals have as much right as humans to exist
8. The balance of nature is strong enough to cope with the impacts of modern industrial nations
9. Despite our special abilities humans are still subject to the laws of nature
10. The so-called ”ecological crisis” facing humankind has been greatly exaggerated
11. The earth is like a spaceship with very limited room and resources
12. Humans were meant to rule over the rest of nature
13. The balance of nature is very delicate and easily upset
14. Humans will eventually learn enough about how nature works to be able to control it
15. If things continue on their present course, we will soon experience a major ecological catastrophe
APPENDIX D. NEW ECOLOGICAL PARADIGM FOR CHILDREN
SCALE ITEMS

(Adaption by Manoli et al., 2007)

1. Plants and animals have as much right as people to live.

2. There are too many (or almost too many) people on earth.

3. People are clever enough to keep from ruining the earth.

4. People must still obey the laws of nature.

5. When people mess with nature it has bad results.

6. Nature is strong enough to handle the bad effects of our modern lifestyle.

7. People are supposed to rule over the rest of nature.

8. People are treating nature badly.

9. People will someday know enough about how nature works to be able to control it.

10. If things don’t change, we will have a big disaster in the environment soon.
APPENDIX E. INFORMED-consent Form

IOWA STATE UNIVERSITY
OF SCIENCE AND TECHNOLOGY

Date: 2/8/2011

To: Michael Quinn
    228 Penn Ct
    McGeheysville, VA 22840

CC: Dr. Tianshu Zheng
    9W MacKay Hall

From: Office for Responsible Research

Title: The Effect of Environmental Education on the Attitudes and Beliefs of Hotel Housekeepers

IRB Num: 10-578

Submission Type: New

Exemption Date: 2/7/2011

The project referenced above has undergone review by the Institutional Review Board (IRB) and has been declared exempt from the requirements of the human subject protections regulations as described in 45 CFR 46.101(b). The IRB determination of exemption means that:

- You do not need to submit an application for annual continuing review.
- You must carry out the research as proposed in the IRB application, including obtaining and documenting informed consent if you have stated in your application that you will do so or if required by the IRB.
- Any modification of this research should be submitted to the IRB on a Continuing Review and/or Modification form, prior to making any changes, to determine if the project still meets the federal criteria for exemption. If it is determined that exemption is no longer warranted, then an IRB proposal will need to be submitted and approved before proceeding with data collection.

Please be sure to use only the approved study materials in your research, including the recruitment materials and informed consent documents that have the IRB approval stamp.

Please note that you must submit all research involving human participants for review by the IRB. Only the IRB may make the determination of exemption, even if you conduct a study in the future that is exactly like this study.
INFORMED CONSENT DOCUMENT

Title of Study: The effect of environmental education on the attitudes and behaviors of hotel housekeepers

Investigators: Michael Quinn and Tianshu Zheng

This is a research study. Please take your time in deciding if you would like to participate. Please feel free to ask questions at any time.

INTRODUCTION

The purpose of this study is to learn more about hotel housekeepers’ attitudes and behaviors towards the environment. You are being invited to participate in this study because housekeepers are important in having a successful recycling program.

DESCRIPTION OF PROCEDURES

If you agree to participate, you will be asked to complete a 10 question survey about your attitudes and behaviors towards the environment; in 60 days you will be asked to complete the same 10 question survey—each survey should take approximately 10 minutes to complete; you may also be selected to take part in an environmental training session that will be held immediately after the first survey and will take approximately 30 minutes.

RISKS

There are no foreseeable risks at this time from participating in this study.

BENEFITS

If you decide to participate in this study there may be no direct benefit to you. It is hoped that the information gained in this study will benefit society by increasing your desire to become more aware of the way people impact the environment. This may lead to an increase in the way you act and as a result you may recycle more often, and make an effort to conserve energy and water as a result of your increased awareness.

COSTS AND COMPENSATION

You will not have any costs from participating in this study. You will not be compensated for participating in this study.

PARTICIPANT RIGHTS

Your participation in this study is completely voluntary and you may refuse to participate or leave the study at any time. If you decide not to participate in the study or leave the study early, it will not result in any penalty or loss of benefits to which you are otherwise entitled. You can skip any questions that you do not wish to answer.

CONFIDENTIALITY

Records identifying participants will be kept confidential to the extent permitted by applicable laws and regulations and will not be made publicly available. However, federal government
regulatory agencies, Crestline Hotels and Resorts, Inc., auditing departments of Iowa State University, and the Institutional Review Board (a committee that reviews and approves human subject research studies) may inspect and/or copy your records for quality assurance and data analysis. These records may contain private information.

To ensure confidentiality to the extent permitted by law, the following measures will be taken: The only identifier on the survey will be a control number that has been assigned to the hotel and a survey number to count the number of surveys completed at each hotel in the survey. A list of employees that take the first survey will be made. This will only be used to make sure that employees taking the second survey are the same as the ones that took the first survey. There will be no way to see which answers an individual employee gave to the questions asked. The investigator will keep the surveys and employee lists in a locked file cabinet and all data files will be password protected. The investigator will retain the surveys for 6 months after the completion of the study before they are shredded. The investigator will maintain the computer files for 18 months after the completion of the study before they are erased. If the results are published, the identity of individual participants will remain confidential.

QUESTIONS OR PROBLEMS

You are encouraged to ask questions at any time during this study.

- For further information about the study contact Michael Quinn at 540-289-6743 or Tienshu Zheng at 515-294-9554.

- If you have any questions about the rights of research subjects or research-related injury, please contact the IRB Administrator, (515) 294-4566, IRB@iastate.edu, or Director, (515) 294-3115, Office for Responsible Research, Iowa State University, Ames, Iowa 50011.

******************************************************************************

PARTICIPANT SIGNATURE

Your signature indicates that you voluntarily agree to participate in this study, that the study has been explained to you, that you have been given the time to read the document, and that your questions have been satisfactorily answered. You will receive a copy of the written informed consent prior to your participation in the study.

Participant’s Name (printed) ____________________________________________

________________________________________  (Participant’s Signature)  (Date)
# APPENDIX F. RECYCLE RELAY SCORECARD

<table>
<thead>
<tr>
<th>Item</th>
<th>Location</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Newspaper</td>
<td>Recycle Bin</td>
<td>10</td>
</tr>
<tr>
<td>2 12oz Aluminum Can</td>
<td>Recycle Bin</td>
<td>10</td>
</tr>
<tr>
<td>3 12oz Aluminum Can</td>
<td>Recycle Bin</td>
<td>10</td>
</tr>
<tr>
<td>4 Glass Beer Bottles</td>
<td>Recycle Bin</td>
<td>10</td>
</tr>
<tr>
<td>5 Glass Beer Bottles</td>
<td>Recycle Bin</td>
<td>10</td>
</tr>
<tr>
<td>6 500mL Plastic Coke Bottle</td>
<td>Recycle Bin</td>
<td>10</td>
</tr>
<tr>
<td>7 Plastic Grocery Bag</td>
<td>Recycle Bin</td>
<td>10</td>
</tr>
<tr>
<td>8 Plastic Scope Bottle</td>
<td>Trash Can</td>
<td>10</td>
</tr>
<tr>
<td>9 Hand Lotion Tube</td>
<td>Trash Can</td>
<td>10</td>
</tr>
<tr>
<td>10 Toothbrush</td>
<td>Trash Can</td>
<td>10</td>
</tr>
<tr>
<td>11 Q Tips</td>
<td>Trash Can</td>
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</tr>
<tr>
<td>12 Shaving Cream</td>
<td>Trash Can</td>
<td>10</td>
</tr>
<tr>
<td>13 Empty Deodorant</td>
<td>Trash Can</td>
<td>10</td>
</tr>
<tr>
<td>14 Empty Toothpaste Tube</td>
<td>Trash Can</td>
<td>10</td>
</tr>
<tr>
<td>15 Kleenex</td>
<td>Trash Can</td>
<td>10</td>
</tr>
<tr>
<td>16 4 AA Batteries</td>
<td>Trash Can</td>
<td>10</td>
</tr>
<tr>
<td>17 Plastic Bathroom Cup</td>
<td>Trash Can</td>
<td>10</td>
</tr>
<tr>
<td>18 Styrofoam Container with Food</td>
<td>Trash Can</td>
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</tr>
<tr>
<td>19 Plastic Burger King Cup</td>
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</tr>
<tr>
<td>20 Shampoo</td>
<td>Trash Can</td>
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</tr>
<tr>
<td>21 Soap</td>
<td>Trash Can</td>
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<td>22 Soap Wrapper</td>
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<tr>
<td>23 Sugar Packets</td>
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</tr>
<tr>
<td>24 Socks</td>
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</tr>
<tr>
<td><strong>Relay Total</strong></td>
<td></td>
<td><strong>Out of 240</strong></td>
</tr>
<tr>
<td><strong>Bonus</strong></td>
<td></td>
<td><strong>10</strong></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>Out of 250</strong></td>
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## APPENDIX G. HOW LONG DOES IT TAKE TIMELINE

<table>
<thead>
<tr>
<th>TEAM</th>
<th>1 to 6 WEEKS</th>
<th>2 to 4 WEEKS</th>
<th>13 YEARS</th>
<th>200-500 YEARS</th>
<th>500 YEARS</th>
<th>NEVER</th>
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<td></td>
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</table>
APPENDIX H. HOW LONG DOES IT TAKE PHOTOS


### APPENDIX I. HOW LONG DOES IT TAKE SCORECARD

<table>
<thead>
<tr>
<th>TEAM</th>
<th>1 to 6 WEEKS</th>
<th>2 to 4 WEEKS</th>
<th>13 YEARS</th>
<th>200-500 YEARS</th>
<th>500 YEARS</th>
<th>NEVER</th>
<th>TOTAL</th>
<th>Bonus</th>
<th>Total</th>
</tr>
</thead>
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<tr>
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<td>Out of 10</td>
<td>Out of 10</td>
<td>Out of 10</td>
<td>Out of 10</td>
<td>Out of 10</td>
<td>Out of 10</td>
<td>10</td>
<td></td>
<td>Out of 70</td>
</tr>
<tr>
<td>2</td>
<td>Out of 10</td>
<td>Out of 10</td>
<td>Out of 10</td>
<td>Out of 10</td>
<td>Out of 10</td>
<td>Out of 10</td>
<td>10</td>
<td></td>
<td>Out of 70</td>
</tr>
</tbody>
</table>
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Exec. Order No. 12,845, 58 F.R. 21887 (1993 comp.)


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VITA

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PROFESSIONAL PUBLICATIONS: