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It's Not Easy Being Green:
An Exploration of the Environmental Attitude-Behavior Gap

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Spring 2012
MAS Marine Biodiversity and Conservation
Capstone Project

Capstone Advisory Committee

Signature ___________________ Print Name ___________________ Date ___________
Affiliation ___________________ Email ___________________ Phone ___________________

Signature ___________________ Print Name ___________________ Date ___________
Affiliation ___________________ Email ___________________ Phone ___________________

Signature ___________________ Print Name ___________________ Date ___________
Affiliation ___________________ Email ___________________ Phone ___________________
Abstract

This paper explores some factors underlying individuals' green attitudes and behaviors that exist when making purchasing decisions. The objective is to provide insights into the consumers' perceptions of eco-friendly products in terms of quality, price, and environmental impacts. It addresses the complexity of the environmental attitude-behavior gap and the challenges "green consumers" may face in the markets. Overall, the paper is able to use data from a small sample of U.S. consumers to suggest a misconception that people believe eco-friendly products to be helpful or have a positive impact on the environment. It also suggests that people's perceptions of "eco-friendly" may differ from product line to product line. Therefore, this author joins the growing number of scholars who suggest a need for improved messaging and more transparency in the green market.

Introduction

There is no doubt human actions are producing irreversible, harmful changes to the environmental conditions that support life on Earth. (OECD 2008)

Considering the detrimental environmental effects produced by pollution, overpopulation, and depletion of natural resources, numerous scholars and public officials have called for increased urgency in motivating people to engage in pro-environmental behaviors. One significant way of meeting such calls involves our behavior as consumers. (Griskevicius, 2010)

By focusing on the "consumer class, "an ever-increasing group of people that exist in both the developed and developing nations," (Mayell 2004), efforts can be made to address consumerism and consumption, which lie at the core of these environmental issues (Erickson 1997).

One way of tackling the environment-versus-consumer challenge is through introducing the environment into the market place. According to the American Marketing Association, "'green marketing' is the development and marketing of products designed to minimize negative effects on the physical environment or to improve its quality." The use of green marketing has been dramatically increasing in recent years. "Since 2009, the number of 'greener' products has gone up by 73%,"
according to a TerraChoice study of green marketing. This has been driven by the consumer demand for more “eco-friendly” products as their concerns for the environment grows (Mazar & Zhong, 2010)—suggesting a rise in environmental consumer attitude and behavior.

The rise in attitude has been proven in numerous studies. People do care about the environment, but the data is not showing an actual rise in the amount of people purchasing “green”. Research shows the surge of green products in the market place is not necessarily removing the barriers that are keeping consumers from engaging in pro-environmental behaviors. ‘Pro-environmental behavior’ is defined as behavior that consciously seeks to minimize the negative impact of one’s actions on the natural and built world (Kollmus & Agyeman, 2002).

A side effect that has developed with the push for more eco-friendly products is the concept of “greenwashing”. There is a difference between green marketing and marketing products as if they are green, and this discrepancy has created skepticism among consumers. One of the issues with green marketing is the use of the words “green” and “eco-friendly”. TerraNova’s, “The Sins of Greenwashing”, explains that the term “green” is “vague, and can mean something different to everyone that uses it or hears it.” (Terra Nova, 2010)

Since no product is actually (yet) “friendly” to the environment, and since recycled fiber (or sustainable harvesting, or low toxicity) isn’t the only environmental impact of a product, loose language like “green”, “eco”, “earth”, can only mislead. (TerraNova 2010)
Studies are finding that greenwashing is slowly improving with experience and legitimate certification systems, but vagueness of messaging, no proof of what actually makes a product ecofriendly, and using false labels are still existent in the market place. Fortunately, as consumers continue to demand, companies will continue to improve; hence, competition and freemarkets will continue to need good information to meet the needs of consumers. (TerraNova, 2010)

The aim of this project was to explore some factors underlying individuals’ green attitudes and behaviors and the gap that may exist between them. By gathering perceptions of “eco-friendly” products, price, and quality I will determine how their beliefs might be contrary to conserving the environment. A survey was designed to compare perceptions throughout the United States to help answer the following questions:

- What are consumers’ perceptions of the “eco-friendly” term?
- What is the perceived quality of “eco-friendly” products?
- What is the perception of price for “eco-friendly” products?
- Do price, quality, and friendliness expectations affect purchase decisions?

While other studies look at people’s opinions of “eco-friendliness” and its significance to their purchasing decisions, this study attempts to analyze perceptions of “eco-friendliness” in terms of a product’s impact on the environment. Interpretation of this data will identify important barriers, as well as, provide insight into some of the complexities that are impeding the environmental agenda.
By focusing on the specific category of household products, it will expose beliefs about items people use and think about daily. It is intended to help guide future studies for the green market, green consumer behavior research, and education. It is also intended to contribute to the dialogue for environmental policy-making and defining the roles or responsibilities of today's consumers.

**Analytical Framework: Where do the barriers come from?**

Understanding human behavior is at the forefront of determining what needs to be done in order to encourage change; however, this is not an easy task. When it comes to environmental behavior, the different elements that create attitude-behavior gaps are extremely complex. So much so, that even the theoretical frameworks are evolving over time. For example, in the early 1970's studies suggested a simple linear model that proposed that if people were educated on how to think pro-environmentally, then they would gain an environmental attitude that would lead to pro-environmental behavior. Over time, research disproved this proposition by demonstrating that increased awareness did not automatically increase pro-environmental behavior. (Kollmuss & Agyeman, 2002).

Psychologists and sociologists alike recognized the need to consider additional elements that might play into the environmental attitude-behavior gap, and many of these frameworks overlap with one another. They pointed out that there are consumers with different levels of environmental concern (Maibach, 2009), as well as, a wide variety of motives (Moisander, 2007). Some examples of different motives are: intrinsic value, economic reasons, and social reasons. There are also
influential factors (Kollmuss & Agyeman, 2002) behind consumer actions. Some variables that could impede environmental behavior include: level of awareness, perceptions, level of trust, economics, demographics, social/cultural norms, politics, attitudes, and locus of control.

**Individuality, Responsibility, and Practicality**

Although it did not consider social factors like social and cultural norms, Blake’s 1999 study discussed three barriers between attitude and behavior that included some of the overlapping points from other theories:

1. **Individuality**: These barriers exist due to a person’s attitude and temperament. Decisions are made based more on desires and needs of that individual and so environmental concerns are outweighed by personal ones.

2. **Responsibility**: These barriers exist when people feel that they cannot make a difference or that it is not their responsibility to act pro-environmentally. Lack of trust in businesses and government may help to create this barrier.

3. **Practicality**: Barriers that are created by social and institutional limitations that do not allow a person to act pro-environmentally (i.e. lack of time, lack of money, or lack of information). (Kollmuss & Agyeman, 2002)

It considers that even if people have intentions of acting pro-environmentally any of these barriers may keep them from doing so. For example, in Maibach’s 2009 study, “Global Warming’s 6 Americas”, U.S. subjects were grouped into categories that represented their level of response to global warming. The six group titles ranged from “Alarmed” (the most concerned about global warming and most engaged in efforts to make change) to “Dismissive” (the least concerned about global warming and the least likely to respond to the issue). The “Alarmed” was the group that had the strongest pro-environmental viewpoints and the most willing to take action;
however, the environmental attitude-behavior gap appeared when they were asked about their pro-environmental behavior:

1. They were only slightly more likely than average to have invested in energy efficiency improvements to their homes or to engage in home energy conservation.

2. They were relatively unlikely to be using alternative forms of transportation.

3. They still report relatively low rates of biking, walking, or using mass transit and carpools. They cite numerous barriers to engaging in these actions more often, such as long travel distances and a lack of options. (Maibach 2009)

Although global warming was the only environmental issue discussed in this assessment, it was evidence that environmental attitude may not always lead to pro-environmental behavior.

**Motivation and Ability**

In another study, motivation and ability were key elements used to explore the complexities of green consumerism. This model theorized that strong motivation paired with the ability to perform a behavior would make it more likely to occur. It drew on the idea that people are not always motivated to do something if they lack the opportunities or necessary resources to do it. (Moisander, 2010) Ecologically responsible consumer behavior can be limited, and it may not always be accessible due to internal and external constraints. According to Peters, Bell, and Thorgersen:

Ecological consumption strategies may be very different because they [consumers] may not know all the ecological relevant behaviors or they may not choose to engage in all of the relevant behaviors, or they may lack the opportunity or ability to do so. (Moisander 2010)
The ambiguity of ecological consumer behavior may actually weaken consumer motivation and create a moral and conceptual deficit that reduces the ability to take action.

**Prosocial Behavior and Altruism**

There are also studies that analyze the social impacts on achieving pro-environmental behavior. They consider frameworks of prosocial behavior and altruism. Prosocial behavior is a pattern of voluntary activity that is performed to help or benefit others. (Knickerbocker; Eisenberg and Mussen, 1989) Altruism is "the motivation to help others out of pure regard for their needs rather than how the action will benefit oneself." (Knickerbocker) Research suggests that these concepts are needed to support pro-environmental behavior. If a person is unable to think beyond him or herself this may inhibit them from acting for the greater good (Allen and Ferrand 1999). Other literature theorizes that when the concern for oneself is stronger than the concern for others and the non-human world, this could become a motivator for pro-environmental behavior as long as it satisfies the personal needs and wants of that person. (Stern et al, 1993) These barriers are important to consider as they can cause conflict in a consumer's decision making.

This project contributes to a larger study that attempts to "address some of the reasons for the environmental attitude-behavior gap, as well as, highlight some of the adverse consumption patterns that might help to harness consumers’ cooperation with the environmental agenda". (Keenan & Gneezy, 2012) It will focus
on the green consumer who expresses an environmental attitude, but fails to follow with corresponding behavior.

Some aspects of this study on green consumers will include looking at: motivation for green choices, ramification of green choices, and the value of green choices (compared to the conventional choices). It will involve smaller studies that will test the prosocial aspect of pro-environmental behavior. Specifically looking at people who choose green products because they really want to or because they think they should. It will also examine the concept of moral licensing which is the idea that a person may behave pro-environmentally for one decision, but then feel that this entitles them to act not so pro-environmentally for another decision.

This type of behavior will also help to understand the possible ramifications of green choices. For example, even though a person buys a green cleaning product, they feel that they can use twice as much as the normal amount. Overuse, excessive waste, and lack of consideration for how they use these products could be just as damaging as non-green choices.

For the measure of value, the research will use consumption of a product as a measure of value. My project will help highlight consumers’ perceptions of the “green” concept, as well as implications for their preferences and purchasing decisions. This will add more dimensions to the value of green choice.
Survey Design and Data Collection

In the initial design of the survey, it was decided that there would be a limited number of questions and only a few products that needed to be presented. By keeping the survey concise, this would lower the chance for exhaustion. I also incorporated six socio-demographic questions, and the New Ecological Paradigm Scale (NEP). The NEP was included as a way to gather data about the respondents’ level of concern for the environment.

Products Tested

Three products were chosen to represent items that the majority of the people use in their everyday lives. The products (paper towels, all-purpose spray cleaners, and hand sanitizers) had to have an “eco-friendly” version and a “conventional” version. Since the goal was to gather data on perceptions of eco-friendliness, price, and quality, it was necessary to include the same product in the conventional form as a true comparison. The paper towels (“Scott Naturals” and “Scott White”) and all-purpose spray cleaner (“Clorox Green Works: All Natural” and “Clorox: Disinfecting”) are common household brands, while the hand sanitizers (“SaniHand Ecofriendly” and “SaniHand” conventional) were designed on a computer and do not exist in the real world market.

Variables Measured

Quality Expectation  Using scales, the respondent was asked to indicate what level of quality they expected the specified product to have. The five options ranged from “Very low quality” to “Very high quality”.

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Price Impression  The second category asked for the respondent’s impression of price. Previous research on consumer perceptions of price and quality points out the importance of keeping price separate from quality when gathering this type of information for products. (Zeithaml, 1988) I chose to put this question second, so it would not influence the consumer’s perception of quality. Having researched the average price range provided for these products, I assigned an actual price quantity for the subject to consider while viewing the product. Since prices vary from store-to-store and region-to-region, I thought it would be helpful to provide a realistic average price that the respondent could consider. I did not want to assume that the respondent would be familiar with the price of any of the products (especially for the hand sanitizer that did not really exist on the market). I also kept the price the same for both versions of each product, so this would not be a factor when I analyzed results. The response was displayed as a sliding numerical scale that the subject could adjust a marker left or right to indicate if they felt the price fell anywhere from “Very Cheap” (left) all the way to “Very Expensive” (right).

Level of Eco-friendliness  The third category was the subject’s perception of the product’s “eco-friendliness”. Since the term “eco-friendly” has many different definitions, it was important to address this category in terms of the product’s effect on the environment. If there were a negative perception of the product’s effect, then it would be perceived as less eco-friendly, and vice versa for a positive perception.
Proper word choice and presentation of the question was essential in eliciting the targeted perception. Initially, it was designed to ask how “harmful or helpful” they believed the product to be for the environment. After considering the products presented and the information desired, it was decided that “harmful/helpful” was not appropriate. The goal was to determine if consumers understood that any man-made product has some sort of effect on the natural environment simply because it is not natural. Also, using “harmful or helpful” might require the respondent to know to what extent or how the product might interact with the environment. It was important to isolate simply whether a product (green or not) would have a positive or negative impact on the environment.

It was also important to provide some background for the question. They were presented with the following: “There is growing interest in understanding the environmental impact of everyday products that people use. Use the scale below to indicate your belief regarding the impact that this product has on the environment.” They used a sliding scale to indicate what level of impact they perceived the product to have: -5 (negative impact), to 0 (no impact), to 5 (positive impact). Once they determined the impact rating, they were asked to explain why they felt that way in a sentence or two.

Familiarities with Product   Subjects were then asked if they were familiar with the product. A simple “yes/no” question would help understand more of the history the subject might have with the product.
**Likelihood to Purchase Product**  The last question was to determine the likelihood of the respondent purchasing the product. They were provided with selecting one of the seven multiple-choice responses (Very Unlikely, Unlikely, Somewhat Unlikely, Undecided, Somewhat Likely, Likely, or Very Likely). This question would help to identify if their perceptions of the product’s attributes would influence their purchasing or behavioral intentions.

**General Environmental Concern**  The New Ecological Paradigm (NEP) Scale (Dunlap & Van Liere 2000) is a set of fifteen questions that was developed to determine a person’s connectedness to nature. It is a revision to the original New Environmental Scale created in 1978. Each item’s response uses a 5-point rating (strongly agree to strongly disagree). It includes five areas: reality to limits of growth, anti-anthropocentrism, fragility of nature’s balance, rejection of exemptionalism, and possibility of an eco crisis. Once the responses were added up, the score indicated the respondent’s general attitude towards the environment.

**Socio-demographic Variables**  The last section of the survey involved questions that gathered demographic information including: gender, age, state, income, children in the household, and the number of children if they had them.

**Data Collection**

To obtain data that would allow me to capture individuals’ attitudes of quality, price, and environmental impact. I designed a survey and distributed it through an online platform (Amazon Mechanical Turk, hereafter, MTurk), that enables data collection
from individuals around the world. I focused my research on U.S. consumers, and collected responses from 300 individuals throughout the country (as equally as possible). Each subject was paid $0.75 for completing the survey, which required less than twenty minutes of his or her time.

Of the available six products, each subject saw only two—one as the green version, and the other, the conventional version, though not from the same category. For example, they would see a picture of an eco-friendly paper towel roll and then a conventional hand sanitizer bottle. Each question was required to be answered in order for the respondent to move on to the next. This ensured answers would be given for each question.

Preliminary Analysis

MTurk returned 304 surveys (4 more than expected) with full responses in about five days. It is important to note that using an online service to distribute the survey limited the respondents to a sample of people who had access to a computer. The sample of respondents was analyzed using the socio-demographic section. This sample had a larger group of males (70%; Table A). The locations of the respondents' residence were categorized into the four regions of the United States; the Northeast had the lowest representation (19%) while the West had the highest (33%). Almost half of the respondents had an annual household income below $50,000, with the biggest group of respondents (18.4%) earning under $20,000. 75% of the subjects were under 45 years old and only 26% had children living in the household.
Table A

Socio-Demographic Data of Respondents

<table>
<thead>
<tr>
<th>Gender</th>
<th>f</th>
<th>%</th>
<th>Age</th>
<th>f</th>
<th>%</th>
<th>U.S. Region</th>
<th>f</th>
<th>%</th>
</tr>
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<tr>
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<td>70</td>
<td>18-25</td>
<td>111</td>
<td>36.5</td>
<td>Northeast</td>
<td>58</td>
<td>19</td>
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<tr>
<td>Female</td>
<td>92</td>
<td>30</td>
<td>26-35</td>
<td>117</td>
<td>38.5</td>
<td>Midwest</td>
<td>61</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>36-45</td>
<td>41</td>
<td>13.5</td>
<td>South</td>
<td>82</td>
<td>27</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>46-55</td>
<td>25</td>
<td>8</td>
<td>West</td>
<td>101</td>
<td>33</td>
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<tr>
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<td></td>
<td></td>
<td>56-65</td>
<td>10</td>
<td>3</td>
<td>Missing</td>
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<td>1</td>
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<td></td>
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<td>66+</td>
<td>0</td>
<td>0</td>
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Key: f-Frequency

Table B

Socio-Demographic Data of Respondents

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<tr>
<th>Household Income</th>
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<th>%</th>
<th>Household Income</th>
<th>f</th>
<th>%</th>
<th>Children</th>
<th>f</th>
<th>%</th>
<th># of Children</th>
<th>f</th>
<th>%</th>
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<td>18</td>
<td>AA</td>
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<td>5</td>
<td>Yes</td>
<td>78</td>
<td>26</td>
<td>0</td>
<td>2</td>
<td>3</td>
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<tr>
<td>B</td>
<td>52</td>
<td>17</td>
<td>BB</td>
<td>12</td>
<td>4</td>
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<td>226</td>
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<td>3</td>
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<td>2</td>
<td>21</td>
<td>21</td>
<td>27</td>
<td></td>
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<tr>
<td>D</td>
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<td>10.5</td>
<td>DD</td>
<td>2</td>
<td>1</td>
<td></td>
<td>3</td>
<td>6</td>
<td>8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>25</td>
<td>8</td>
<td>EE</td>
<td>2</td>
<td>1</td>
<td></td>
<td>4</td>
<td>3</td>
<td>4</td>
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<td></td>
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<tr>
<td>F</td>
<td>25</td>
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<td>11</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

Key: A - under $20,000; B - $20,000-29,999; C - $30,000-39,999; D - $40,000-49,999; E - $50,000-59,999;
F - $60,000-69,999; G - $70,000-79,999; H - $80,000-89,999; AA - $90,000-99,999;
BB - $100,000-109,999; CC - $110,000-119,999; DD - $120,000-129,999; EE - $130,000-139,999;
FF - $140,000-149,999; GG - $150,000+

NEP Scores

I was particularly interested in understanding the environmental “connectedness” of the respondents in this study, so I broke down the NEP results and compared them to other socio-demographic areas. The NEP scale ranges from 15 (the least environmentally concerned) to 75 (the most environmentally concerned), and I calculated this sample to have a mean score of 52, suggesting that as a whole, my respondents’ were relatively connected the environment. Using frequency tables to create comparisons, I first compared average NEP scores across the four U.S. regions: Northeast (50.1), Midwest (51.7), South (51.7), and West (55.2). This did not show much of a variation among regions and suggest that the majority of the
U.S. has the same level of environmental connectedness. I also compared the NEP scores among the age groups (Graph A). Again, the numbers do not show a huge variation among people of different ages and their connectedness to nature.

Graph A: NEP Scores and Age

Analysis of Test Attributes

Next, I analyzed the individual product's effect on the respondent's perception of quality, price, and "eco-friendliness". Their means were calculated to compare the respondents' perceptions of green products to conventional products. I used a regression analysis to assess the impact of the predictor variable (green or not) on a criterion variable (quality, price, and eco-friendliness). Graph 1 explains the overall perception of each product's attribute. Table 1 refers to the average mean of each attribute for the combined green products and conventional products. The label "green" refers to "eco-friendly" products, and I will use these terms interchangeably.
Table 1: Combined Means for Quality, Price, and Impact

<table>
<thead>
<tr>
<th>Green</th>
<th>N</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality</td>
<td>Yes</td>
<td>303</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>305</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>608</td>
</tr>
<tr>
<td>Price</td>
<td>Yes</td>
<td>303</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>305</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>608</td>
</tr>
<tr>
<td>Impact</td>
<td>Yes</td>
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<td>305</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>608</td>
</tr>
</tbody>
</table>

Graph 1: Individual Products Means for Quality, Price, and Impact

Graph 2: Individual Product Means for Quality
Quality  As can be seen in Graph 2, respondents perceived all the products (both green and conventional) to be of average to high quality. There was little difference between their means of the paper towels and spray cleaners, suggesting that the green paper towels had a perceived higher quality than the conventional paper towels. In contrast, the conventional all-purpose spray cleaner was perceived to be of higher quality, relative to the green all-purpose spray. However, since their differences were not smaller than .05, then the differences most likely did not exist. Lastly, the hand sanitizer means showed that there was an overall perception that green hand sanitizer had a higher quality than the conventional brand. Therefore, the difference in quality perception was only significant for hand sanitizer (Green = 3.63, conventional = 3.50; p < .01).

These results support the idea that the perception of quality for a product changes when it becomes personal. There is this “closeness” concept in terms of using products on our bodies versus other products we would use for say, inanimate objects. Another words if a product is green and it is for personal use, we may perceive it as high quality because it won’t be as harmful. If the product is not green and it is personal, it may be perceived as low quality because it may be too harsh on our bodies. Conversely, if the product is green, and it is not personal or not used for our bodies, we might perceive it as low quality because it may not be as effective for how we want to use it. Finally, if the product is not green and again it is not a personal product, it might be perceived as high quality because it would be more effective with stronger ingredients.
Diagram 1: Perception of Green Products (Personal vs. Not Personal)

<table>
<thead>
<tr>
<th>Closerness</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal</td>
<td>High Quality</td>
<td>Low Quality</td>
</tr>
<tr>
<td>Not Personal</td>
<td>Low Quality</td>
<td>High Quality</td>
</tr>
</tbody>
</table>

*Price*  When looking at price, the overall mean for the green products was 6.30 on a scale of 1 (Very Cheap) to 9 (Very Expensive). Therefore, the average perception of price for all the green products was somewhat expensive, but more in the middle range of the scale. The same could be said for the perception of conventional products' prices with an overall mean of 6.12 (Table 1). Although there is a minimal difference, this data shows that people perceive green products to be more expensive than conventional. Analyzing each product for price shows that there is very little disparity among paper towels and hand sanitizers, but more of significance ($p = .053$) between the spray cleaners (Graph 3).

Graph 3: Individual Product Means for Price
Eco-friendliness  Impact rating helped determine the respondent’s perception of how environmentally friendly a product is. Overall, on a scale of -5 (negative impact = damaging for the environment) to 0 (no impact) to 5 (positive impact = helpful for the environment), the means for each product display a perception that the conventional products have a negative impact on the environment while the green products have a positive impact on the environment. What is interesting here is that all three green products do not help the environment in anyway, and should all have been scored in the negative range, but this was not the case.

Across all three products, subjects believe that the spray cleaner would have the largest impact on the environment (see Graph 4). It also showed that conventional hand sanitizer would have the smallest negative impact, followed by paper towels, and then spray cleaner. Among the green products, the cleaner spray would have the most positive impact, followed by the hand sanitizer, and then paper towels.

The overall mean for both green (.95) and conventional products (-.91) is less than one unit away from 0 (no impact). This explains that regardless of which direction the respondents view the impact of the products; they perceived them as having relatively minimal impact. Of all attributes tested, the largest and most significant effect observed was with individuals’ perceptions of products’ impact on the environment ($p < .01$), which indicates that a product’s greenness affect the perception of how useful versus damaging, it is to the environment.
Regression analyses showed that whether a product's type (green vs. not) affects consumers' perceptions of products' quality and relative impact on the environment, but not their perceptions of their expensiveness (whether the product is overpriced). (See Table 2 and Table 3)

Graph 4: Individual Product Means for Eco-friendliness

Tables 2 & 3: Regression Outputs for Quality and Environmental Impact

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>(Constant)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3.769</td>
<td>.096</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Green</td>
<td>-.135</td>
<td>.061</td>
<td>-.090</td>
<td>-2.225</td>
</tr>
</tbody>
</table>

a. Dependent Variable: quality

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>(Constant)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2.816</td>
<td>.264</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Green</td>
<td>-1.862</td>
<td>.167</td>
<td>-.412</td>
<td>-11.146</td>
</tr>
</tbody>
</table>

a. Dependent Variable: impact
Analysis of Socio-demographic Data and NEP Score

Regression assessments were also used to predict the effects of respondents' demographics and environmental concerns (NEP score) on perceptions of quality, price, and environmental impact. The covariates that were considered were NEP scores, age, gender, children living in the household, and the number of children. Results showed that having children had no effect on the perception of all three attributes. Gender had an effect, but it disappeared when age was added to the model. NEP score was a significant predictor only of the respondents' perceptions of quality, and the correlation was positive across all data. In other words, as the respondents had more environmental concern (higher score), the higher their perception was of the quality of green products. Age was the only significant predictor across all three attributes, so this is where I will discuss the results in depth.

Graph 5: The Effect of Age on Perceptions of Quality, Price, and Impact

![Graph showing the effect of age on perceptions of quality, price, and impact.](image)
First, I used the results of the initial comparison of the effects of green and conventional products on the perception of quality, price, and eco-friendliness, and then I added "age" as the covariate. The results (Graph 5), for each attribute suggest that the age of the respondents does have some of effect on people's perceptions--specifically for paper towels and cleaner.

Next, the perception of quality among age groups is relatively similar across the age groups (Graph 5); however, the respondents between the ages 36-45 appear to have the highest perception of quality of these green products.

Generally speaking, the effect of age on the perception of price had a positive correlation--as the ages increased so did the respondents' views of how expensive green products were. Overall, the 56-65 year olds found the green products to be the most expensive and the conventional products to be the least expensive.
As for the effect of age on perceptions of environmental impact (Graph 7), the general trend was similar to the perceptions of price. The youngest respondents viewed the green products to have the lowest positive impact on the environment, and then the impact became more positive with the rise in age. Also, the trend for the perception of environmental impact of the conventional products were viewed as more negative among the younger subjects and less negative as the ages increased (except for the 56-65 year olds).

Graph 8: Likelihood of Purchasing a Product Based on Eco-Friendliness

<table>
<thead>
<tr>
<th>Likelihood of Purchasing a Product That Was Perceived to Have a Negative Impact on the Environment</th>
</tr>
</thead>
<tbody>
<tr>
<td>% of Products w/ Neg. Impact</td>
</tr>
<tr>
<td>Very Unlikely</td>
</tr>
<tr>
<td>0</td>
</tr>
</tbody>
</table>

I used frequency tables to determine the effect of the perception of environmental impact on the likelihood that a respondent would purchase the product. I found that out of the 608 products surveyed, 279 were perceived as having a negative impact on the environment (46%). Graph 8 shows that, although there is a negative perception of both green (14%) and conventional products (32%), the respondents are still somewhat likely to purchase them. Specifically, 42% of all the negatively viewed products are “somewhat likely” to “very likely” to be purchased. I went
further to compare perceptions from the respondents with NEP scores above 50 (more environmentally concerned), to see what their likelihood was for purchasing products they viewed as having a negative impact on the environment. I discovered that even though people had higher NEP scores, they were still “somewhat likely” to “very likely” to purchase the negatively perceived products (27%). This suggests the environmental attitude-behavior gap that was discussed earlier. For the people who were not connected to nature (an NEP score of 45 or below), only 10% were “somewhat likely” to “very likely” to purchase the product.

Discussion

The findings for this exploratory project answered the initial questions of perceptions for quality, price, and environmental impact; however, price and quality were only really significant with specific products (quality for hand sanitizer and price for cleaner spray). I believe the perceptions of quality for the green hand sanitizer may be related to the idea of it being a personal product, and this phenomenon of people viewing something natural and gentler on their skin as higher quality. Price varies from product to product, so this is a difficult concept to use in a general way across these three products. Price is also tricky due to the touch economic times, and it might influence how people consider green due to the other “stressers” that exist in their lives.

For perceptions of environmental impact, respondents believed eco-friendly products were considered helpful to the environment. This could imply that people believe that eco-friendly products will actually benefit the earth in some way, and if
so, could that mislead them to use it in a wasteful or inconsiderate way? This supports a recent study done in the 2011 Green Gap Tracker assessment done by the research company, Cone, "While 97 percent feel they know what phrases like "green" and "environmentally friendly" mean, 41 percent incorrectly think they mean products have a positive or beneficial impact on the environment, instead of being less bad." (Bardelline, 2011) On the other hand, this perception could also play an important role for green marketing if people view these products in a positive way, continuing a desire to have green as an option. Additionally, this scenario may be that the data represented just how consumers interpreted the scale and wording of the environmental impact question.

Finally, the environmental attitude-behavior gap existed amongst the participants when it came to these specific household products. It is important to point out that this information is only a snapshot of U.S. consumer perceptions, but it has implications for how they value green products.

For future studies on the same attributes of eco-friendly products, there are some adjustments that need to be considered. First, I would gather the respondent’s individual interpretations of the word “eco-friendly”. By having the subjects provide their own definitions, it would give insight into why they responded the way they did, and what they know. Second, surveying larger samples of people in various formats (mail, phone, etc.) would reduce skewed results. Although online surveys are great in terms of getting information back quickly, it may have had some bias since it required a pool of respondents that had access to a computer. Third, it
would be more accurate to specify what “quality” and “environmental impact” refers to for this survey. These terms may have different meanings to different people and more clarification could provide better results. Lastly, by focusing on one type of product line as opposed to three different kinds it would narrow the focus. It is possible that each type of product requires specific behavioral intentions, therefore, it might be insufficient to group personal products and cleaning products together. For example, perceptions of quality, price, and environmental impact might be very different for personal products (hand sanitizer) compared to non-personal products (cleaner spray).

Looking forward, it is important to continue to think about the responsibilities of all the key players and what the expectations should be for them. Perhaps the first step that businesses, policy-makers, and educators need to take is improving messaging. For example, maybe we need to stop calling products “friendly” and use the words “environmentally effective” instead. In addition, maybe looking at price and quality across various products isn’t enough, and there needs to be a closer look at each individual product line for ecofriendliness.

In terms of consumerism and conservation, I believe with improved policies, stronger regulations, and a combined effort by businesses and individual consumers, change will be possible. Individual consumers can continue to demand more information about their products and work together to advocate for the environment in the market place.
References


Intro Hello! For this study, we would like you to provide feedback on some products. For each product, please look at the picture provided and then answer the questions that follow. If you are not familiar with the product, answer the questions based on impression and on the information provided. Note that there are no 'right' answers.

GTowel

quality
What is the quality you expect this product to have?

Very low quality (1)
Low quality (2)
Average quality (3)
High quality (4)
Very high quality (5)

price
This product is priced at $2.22/roll. What is your impression of this price?

_____ Slide left or right (1)

impact

There is growing interest in understanding the environmental impact of everyday products that people use. Use the scale below to indicate your belief regarding the impact that this product has on the environment.

_____ Slide left or right (1)

why

Why did you give that impact rating?

familiar

Are you familiar with this particular product?

Yes (1)
No (2)

purchase

How likely would you be to purchase this product if you needed paper towels?

Very Unlikely (1)
Unlikely (2)
Somewhat Unlikely (3)
Undecided (4)
Somewhat Likely (5)
Likely (6)
Very Likely (7)
quality

What is the quality you expect this product to have?

Very low quality (1)
Low quality (2)
Average quality (3)
High quality (4)
Very high quality (5)

price

This product is priced at $2.22/roll. What is your impression of this price?

_____ Slide left or right (1)

impact
There is growing interest in understanding the environmental impact of everyday products that people use. Use the scale below to indicate your belief regarding the impact that this product has on the environment.

_____ Slide left or right (1)

why

Why did you give that impact rating?

familiar

Are you familiar with this particular product?

Yes (1)
No (2)

purchase

How likely would you be to purchase this product if you needed paper towels?

Very Unlikely (1)
Unlikely (2)
Somewhat Unlikely (3)
Undecided (4)
Somewhat Likely (5)
Likely (6)
Very Likely (7)

Clorox
quality

What is the quality you expect this product to have?

Very low quality (1)
Low quality (2)
Average quality (3)
High quality (4)
Very high quality (5)

price

This product is priced at $4.56/bottle. What is your impression of this price?

_____ Slide left or right (1)
There is growing interest in understanding the environmental impact of everyday products that people use. Use the scale below to indicate your belief regarding the impact that this product has on the environment.

_____ Slide left or right (1)

**why**

Why did you give that impact rating?

**familiar**

Are you familiar with this particular product?

Yes (1)

No (2)

**purchase**

How likely would you be to purchase this product if you needed an all-purpose spray cleaner?

Very Unlikely (1)

Unlikely (2)

Somewhat Unlikely (3)

Undecided (4)

Somewhat Likely (5)

Likely (6)

Very Likely (7)

GClorox
quality

What is the quality you expect this product to have?

Very low quality (1)
Low quality (2)
Average quality (3)
High quality (4)
Very high quality (5)

price

This product is priced at $4.56/bottle. What is your impression of this price?

_____ Slide left or right (1)
impact

There is growing interest in understanding the environmental impact of everyday products that people use. Use the scale below to indicate your belief regarding the impact that this product has on the environment.

_____ Slide left or right (1)

why

Why did you give that impact rating?

familiar

Are you familiar with this particular product?

Yes (1)

No (2)

purchase

How likely would you be to purchase this product if you needed an all-purpose spray cleaner?

Very Unlikely (1)

Unlikely (2)

Somewhat Unlikely (3)

Undecided (4)

Somewhat Likely (5)

Likely (6)

Very Likely (7)

CSanitizer
quality

What is the quality you expect this product to have?

Very low quality (1)
Low quality (2)
Average quality (3)
High quality (4)
Very high quality (5)

price

This product is priced at $4.63/bottle. What is your impression of this price?

_____ Slide left or right (1)
impact

There is growing interest in understanding the environmental impact of everyday products that people use. Use the scale below to indicate your belief regarding the impact that this product has on the environment.

_____ Slide left or right (1)

why

Why did you give that impact rating?

familiar Are you familiar with this particular product?

Yes (1)

No (2)

purchase

How likely would you be to purchase this product if you needed a hand sanitizer?

Very Unlikely (1)

Unlikely (2)

Somewhat Unlikely (3)

Undecided (4)

Somewhat Likely (5)

Likely (6)

Very Likely (7)

GSanitizer
quality

What is the quality you expect this product to have?

Very low quality (1)
Low quality (2)
Average quality (3)
High quality (4)
Very high quality (5)

price

This product is priced at $4.63/bottle. What is your impression of this price?
impact

There is growing interest in understanding the environmental impact of everyday products that people use. Use the scale below to indicate your belief regarding the impact that this product has on the environment.

why

Why did you give that impact rating?

familiar

Are you familiar with this particular product?

Yes (1)

No (2)

purchase

How likely would you be to purchase this product if you needed a hand sanitizer?

Very Unlikely (1)

Unlikely (2)

Somewhat Unlikely (3)

Undecided (4)

Somewhat Likely (5)

Likely (6)

Very Likely (7)

gender
What is your gender?

Male (1)
Female (2)

age

What is your age category?

18-25 (1)
26-35 (2)
36-45 (3)
46-55 (4)
56-65 (5)
66+ (6)

state

What state do you live in?

income

What is your total annual household income?

under $20,000 (1)
20,000-29,999 (2)
30,000-39,999 (3)
40,000-49,999 (4)
50,000-59,999 (5)
60,000-69,999 (6)
70,000-79,999 (7)
80,000-89,999 (8)
90,000-99,999 (9)
100,000-109,999 (10)
110,000-119,999 (11)
120,000-129,999 (12)
130,000-139,999 (13)
140,000-149,999 (14)
150,000+ (15)
NEP Listed below are statements about the relationship between humans and the environment. For each one, please indicate the extent to which you agree or disagree with the statement. Provide a rating from Strongly Disagree to Strongly Agree using the following scale:

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Disagree (1)</th>
<th>Mildly Disagree (2)</th>
<th>Unsure (3)</th>
<th>Mildly Agree (4)</th>
<th>Strongly Agree (5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>We are approaching the limit of the number of people the earth can support. (1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Humans have the right to modify the natural environment to suit their needs. (2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>When humans interfere with nature it often produces disastrous consequences. (3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Human ingenuity will ensure that we do NOT make the earth unlivable. (4)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Humans are severely abusing the environment. (5)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The earth has plenty of natural resources if we just learn how to develop them.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Plants and animals have as much right as humans to exist. (7)

The balance of nature is strong enough to cope with the impacts of modern industrial nations. (8)

Despite our special abilities, humans are still subject to the laws of nature. (9)

The so-called "ecological crisis" facing humankind has been greatly exaggerated. (10)

The earth is like a spaceship with very limited room and resources. (11)

Humans were meant to rule over the rest of nature. (12)

The balance of nature is very delicate and easily upset. (13)

Humans will
eventually learn enough about how nature works to be able to control it. (14) If things continue on their present course, we will soon experience a major ecological catastrophe. (15)
children

Are there children under the age of 18 who live in your household?

Yes (1)

No (2)

Answer

If Are there children under the age of 18 who live in your h... Yes Is Selected

#children How many children?