

Consumer Perceptions of Greenwashing: Understanding Awareness, Trust, and Effectiveness

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A thesis submitted to the  
University of Colorado at Boulder  
in partial fulfillment  
of the requirements to receive  
Honors designation in  
Environmental Studies  
May 2018

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## ***Abstract***

“Green” and more sustainable alternatives are advertised to consumers at nearly every purchasing decision. What consumers aren’t always aware of is that these products may not be as environmentally friendly as they state. Greenwashing is a phenomenon in which companies exaggerate or even lie about their claims to mislead and encourage consumers to purchase their products. Through an online survey, I collected and analyzed the perceptions of 368 participants from all over the U.S. This allowed me to determine if consumers believe a product with a greenwashed label is more sustainable than a product without a label at all. I was also able to determine if consumers were skeptical of the greenwashed labels and if they could recognize them as greenwashed claims, and furthermore, if those claims influenced their purchasing intention. Through a primarily quantitative study this honors thesis concluded that participants were more likely to believe a product was sustainable and they had a higher overall perception of the product, if it had a greenwashed label than if it didn’t. Participants weren’t skeptical of the labels at first, but once they were made aware of this phenomenon, they were able to identify labels as greenwashed. This honors thesis cannot conclude one type of greenwashing had more of an effect on consumers purchase intent than another. In addition, participants who ranked as High environmentalists fell into the trap of greenwashing as far as sustainability of the product, but they were more skeptical, had a greater ability to identify it, think it was problematic, and think it was common than Low and Moderate environmentalists. I also discovered older individuals were more trusting and less likely to believe greenwashing is problematic than younger individuals. Through these conclusions it becomes evident that greenwashing still works in convincing consumers they are getting a more environmentally friendly product that they actually are, and every consumer is vulnerable. Consumers were much more sensitive once their attention was brought to greenwashing. We need increased education and improved policies to help consumers get exposed to which labels are real, which ones aren’t, and when they are witnessing greenwashing in their everyday lives. As far as the future, further studies should look at the ability of consumers to recognize a greenwashed label or product from one that is not greenwashed.



## ***Preface***

The basis for this research came from my interest in consumers behaviors and their environmental decisions. It started out as a question of why, even when consumers have environmental concerns, do they choose products that are more harmful than available alternatives? This idea took a turn when I learned about the concept of “greenwashing;” I started looking more closely at the products I was buying. I realized that even as an Environmental Studies student, who knows more about what is beneficial for the environment than the average consumer, I had hardly any idea which labels to trust. I started seeing things like “All-natural” and thinking, “Yes that sounds good, but what does that really mean?” I began to wonder if other individuals often think they are choosing an environmentally friendly product when it may not be. I also began wondering if other consumers were skeptical of labels and the environmental claims, as I was. I became fascinated with finding answers to these questions and conducting my own research to draw some conclusions.

In truth, I could not have achieved this level of success without the patient and unfailing support from my committee members. Amanda Carrico, my Committee Chair, provided wisdom and experience that made the entire process possible for me. Through IRB approval, survey design, data analysis, and so much more, she guided me. Without her, I would have been lost. Heather Adams never failed to believe in me and provided not only enthusiasm, but time and dedication to aiding me with editing of the document itself. Finally, Dale Miller was the one who had faith when I doubted myself and had encouragement for when I needed to push myself further. Each committee member was integral to the creation of this Honors Thesis. My friends and family were there to provide love and encouragement at every turn as well. I thank you all for your unwavering support.



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## ***Introduction***

In this day and age, it seems as if a company won't survive if it doesn't take necessary steps to protect the environment. As a result, everywhere you look, another company is going "green." If you walk down the aisles of stores like Target you can find cleaning products, paper towels, makeup, light bulbs, and appliances all with "green" alternatives. Some products have eco-labels, some make claims like "environmentally friendly" or "recyclable," and some only go as far as making their packaging physically greener and leafier in appearance. It has become a successful and popular strategy to make these sorts of environmental claims and changes to attract consumers. The problem is, while the environmental benefits of some companies' products and claims are authentic, others aren't and are intended to mislead consumers. The ones that aren't, are guilty of a phenomenon known as 'greenwashing.' Greenwashing is divided into several types called "sins." The different "sins" a company or product can commit depend on how the claim is being manipulated. For instance, the claim may just be very vague and hard for the consumer to understand, or it may be completely false: each sin is different; I will go into more detail on this later on.

Not only have some researchers found that greenwashing can create consumer confusion and skepticism, but that it could potentially eliminate the need to innovate greener products. With human consumption, especially in the US, being as high as it is and having such grave environmental consequences, it is crucial the products we consume become greener, as well as the companies. Several national standards have been developed to try to eliminate greenwashing by only providing their seal of approval if certain requirements are met. The prevalence of greenwashing is decreasing slowly, but it is still a serious issue. For this study, I started out wanting only to assess consumer awareness of this problem. However, as I did more research I



realized consumer awareness was only a small piece of the puzzle. The research questions I wanted to address were: (1) Do consumers believe a product with a greenwashed label is more sustainable than a product without? (2) Are consumers skeptical of a greenwashed label's claims and do those claims influence their purchase intent? (3) Are consumers aware that a product's label is greenwashed? Thus, I tested the following hypotheses: (1) Consumers will believe a product is more sustainable if the product has a greenwashed label than a product that does not; (2) Consumers will be skeptical and untrusting of a greenwashed label on a generic product; (3) Consumers will have varying purchase intents based on the sin of the greenwashed label; (4) Consumers will believe greenwashing is problematic, but they will not be able to identify a greenwashed label.

## ***Background***

We consume almost every day of our lives, especially in the United States. It is crucial to examine the effects of such habits on the environment. Luckily, many consumers do care and want to make changes so that their consumption has a less severe impact on the environment. This is why green advertising and later on, greenwashing came to be. Here I will examine how such a transition came about, as well as the unique sins that make up greenwashing.

## **Environmental Effects of Consumer Consumption**

Private consumption is an integral part of our daily lives and worldwide is increasing at an alarming rate. As of 2000, the amount spent on goods and services at the household level topped \$20 trillion, which was a four-fold increase from 1960 (Gardner, Assadourian, & Sarin, 2004). Households are not only consuming more, but the global population is also on the rise, of which the UN believes will reach 8.9 billion in 2050 (Gardner et al., 2004). Furthermore, as of

2002, there were 850 million long-established consumers in wealthy countries and an additional 1.1 billion new consumers in 17 developing and 3 transition countries (Myers & Kent, 2003). That number is continuing to skyrocket, and it will have a serious environmental impact across the globe. In one particular study published in 2015, it's clear households are causing significant environmental pressure with consumption giving rise to 60% of global greenhouse gas emissions and making up between 50% and 80% of total resource use (Ivanova et al., 2016). Looking solely at the United States where consumption is built into our culture, the impacts are even more severe. Whether it is fresh-water, food products, energy, electronics, homes, or cars, Americans consume more. Americans account for only five percent of the world's population but create half of the globe's solid waste, as well as uses one-third of the world's paper and a quarter of the world's oil (Scheer & Moss, n.d.). The United States is consuming at an unsustainable rate and it has an extreme impact on the environment.

### **Consumer Concern for the Environment**

Sounds bleak, right? Well, there is a bright side: consumers are catching on. As the wellbeing of the environment becomes more critical, an increasing magnitude of consumers around the world are more conscious of environmental issues and therefore, claim they're willing to consume more sustainable products. In fact, consumer attitudes toward green brands, green products, and green companies are reaching an all-time high. For many consumers, they care whether a company has a socially-responsible business model. This goes even deeper to the products themselves. Since 2009, there has been an 8% increase, to 59%, of consumers who prefer to purchase products that are sustainably manufactured (Bonnell, 2015). U.S. consumers are also 58% more likely to try a company's products and 53% more likely to become repeat customers if they are aware that company is environmentally and socially conscious (Bonnell,

2015). This concern among consumers also varies globally. In the US, 69% of Americans care about a company's social responsibility. However, in the UK 70% of citizens care about a company's social responsibility; Brazil is at 85% and China tops it out at 94% (Bonnell, 2015). Since being “sustainable” has become a popular trend and environmental concern is becoming more mainstream among consumers, it is advantageous for companies to make changes accordingly. Companies of all shapes and sizes have caught on, realizing this trend can potentially affect consumers’ purchasing decisions. As a result, more products are advertising how green they are.

### **Green Advertising**

Green advertising started in the 1970s after oil prices skyrocketed. People started becoming aware of the limited resources available and the grave environmental damage (Krafft, 2014). Companies began to follow suit and respond to consumer concern by communicating their efforts toward becoming environmentally friendly in their marketing strategies (Haytko & Matulich, 2008; Krafft, 2014). For many consumers, it was no longer enough to have an appealing logo or brand, they wanted social responsibility from companies (Krafft, 2014). In one particular study by the American PR firm Edelman, they examined consumers attitudes toward social responsibility problems. They found that of 8,000 consumers, regardless of country, believe environmental responsibility is increasingly important and 85% of them said they were willing to change brand or their own behavior to improve the environment (Krafft, 2014). As a result, companies began responding. As a specific example, from 2009 to 2010 alone, the number of green products went up by 73 percent (TerraChoice, 2010). Green advertising is a strategy in which companies can show consumers they care for the environment and they may choose to do so for any of the following reasons: other stakeholder groups going green, the

emergence of a group of green consumers, or responsible business development (Nyilasy, Gangadharbatla, & Paladino, 2013). Of those reasons though, consumers, are arguably the most important group a company will try to appeal to. When companies make the decision to participate in green advertising they can make various sorts of environmental claims to show consumers their efforts in reducing environmental impact. Carlson et. al. (1993) categorizes them into five different types.

1. Product orientation: emphasizes product attributes.
2. Process orientation: techniques of production used in the company.
3. Image orientation: associates the organization with an environmental cause.
4. Environmental statement about the environment as a whole.
5. Combination of claims.

As companies promote either their green products and services or the changes they are making within their company, it has become a popular and successful trend: one in which others want to join in on. Studies have found that ads with green claims were more effective in generating favorable brand attitudes than ads without any green claims. Thus, green ads seem to generate positive responses from consumers (Mobley, Painter, Untch, & Unnava, 1995; Nyilasy et al., 2013). Other studies also show an obvious correlation between green advertising and purchase intention (Khandelwal & Bajpai, 2011). It is in the best interest of companies minimize negative attitudes for their reputation and take advantage of any opportunity to generate positive attitudes and intentions from consumers. The desire to be successful through appealing to consumers' concerns for the environment and meeting their demands, has ultimately led to 'greenwashing.'

## **Greenwashing**

Greenwashing, in this study, is defined as misleading or deceptive environmental claims that are either vague, false, omits important information or a combination of these (Carlson, Grove, & Kangun, 1993). Sometimes a company or organization may spend both time and money claiming to be “green” through various marketing and advertising strategies in order to gain business from consumers, but in actuality, the company hasn’t actually implemented any business practices to reduce their environmental impact. Or in the case with specific products, often the claims are broad, or the third-party certification doesn’t take into account the entire lifecycle of the product. This is due to the fact that more often than not it is in the best interest of the company to minimize sharing their low environmental performance with consumers (Nyilasy et al., 2013). According to Delmas and Burbano (2011), there are four underlying reasons companies choose to participate in greenwashing:

1. There are expectations from customers and competitors to exhibit positive environmental improvements.
2. Those within an organization may be less ethical and instead more financially motivated so they may only want to improve their environmental reputation to increase profits.
3. Sometimes various parts of the organization, such as the marketing teams, may create environmental targets and start advertising the company as green before the requirements are met.
4. Sometimes a green marketing strategy may get developed, but other parts of the organization may not want it.

For all these reasons, companies can easily commit the sins of greenwashing.

## **History of Greenwashing**

Greenwashing is not a new phenomenon and has been fairly widely recognized since the mid 1980s (Dahl, 2010). However, this practice has increased dramatically in recent years as consumers' environmental concerns increased and companies try to keep up with demands. Advertising consultancy TerraChoice Environmental Marketing conducted a study to better understand the rapid growth of greenwashing. Looking at "big box" stores they identified 1,018 consumer products exhibiting 1,753 environmental claims. They found that "of those 1,018 products, all but one made claims that are demonstrably false or that risk misleading intended audiences" (TerraChoice Environmental Marketing, 2007). This indicates 98% of these products are guilty of greenwashing and the problem is only getting worse (TerraChoice Environmental Marketing, 2007). After analyzing their data, TerraChoice identified seven patterns in greenwashing termed the "sins" of greenwashing.

### *Sin of the Hidden Trade-Off*

Of all the products TerraChoice looked at, this sin was the most common among the products they looked at. This sin is committed when a product indicates it's "green" only based on a single environmental quality or a very small set of qualities and refuses to report the entire lifecycle of the product. The issue with this sin is not that the claims are false, but that it makes products look much more green than a full life cycle analysis would show (TerraChoice Environmental Marketing, 2007). An example TerraChoice brings to light is copy paper that promotes their recycled content without addressing the negative environmental impacts of manufacturing like pollutants to the air and water (TerraChoice Environmental Marketing, 2007).

### *Sin of No Proof*

This sin is identified as any environmental claim on a product that can't be easily confirmed by accessible information or a reliable third-party certification (TerraChoice Environmental Marketing, 2007). TerraChoice found 454 products were guilty of this sin, making it the second most frequent. Of the products they tested, a few examples of products were household lamps, facial tissues, paper towels, and personal care products. For instance, they found lamps and lights that promoted energy efficiency without any evidence in support of this claim (TerraChoice Environmental Marketing, 2007).

### *Sin of Vagueness*

This sin causes intended consumers to misunderstand claims on products because of how poorly defined or broad they are (TerraChoice Environmental Marketing, 2007). Some of these broad claims TerraChoice found in their study are terms like “chemical-free,” “non-toxic,” “all-natural,” and “green” (TerraChoice). Each of these poses their own set of concerns. At first glance, all these things seem positive, but if taking a moment to think about it, what do these claims really mean? For instance, “green” has no meaning without further explanation and “all-natural” is dangerous because certain elements like uranium or mercury are natural, but also poisonous (TerraChoice Environmental Marketing, 2007). It is so vague that when you dig a little deeper, it's quite difficult to unpack the true meaning behind the claim.

### *Sin of Irrelevance*

This sin is in regard to products that contain claims that are most likely true but aren't helpful in actually determining which products are more environmentally friendly (TerraChoice Environmental Marketing, 2007). This can not only be distracting for consumers but can

completely derail them from making uses that are actually environmentally beneficial.

TerraChoice highlights the most frequent occurrence of this sin is chlorofluorocarbon (CFCs) claims; these are undoubtedly incredibly damaging to the ozone but have also been banned for almost 30 years in the US. Thus, claiming a product is CFC-free isn't indicating that product is more "green" than any other product because all products are CFC-free (TerraChoice Environmental Marketing, 2007).

#### *Sin of Lesser of Two Evils*

This sin is identified as "green" claims that are likely true, but simply are an attempt at distracting consumers from the environmental impacts (TerraChoice Environmental Marketing, 2007). An example TerraChoice found was organic cigarettes. This is not to say that choosing the greenest option is not most beneficial but making a product "green" shouldn't influence consumers to purchase it solely because they believe they are helping the environment, when in reality making the choice in the first place is not good.

#### *Sin of Fibbing*

This sin is when products make environmental claims that are not true. One example was a caulking product TerraChoice looked at where claims of being "Energy Star" registered were made, but the Energy Star website didn't support this (TerraChoice Environmental Marketing, 2007). This sin is one of the most serious, but luckily from the study completed by TerraChoice, their data indicates this sin is the rarest. (2007). Only several products committed this sin.

#### *Sin of Worshiping False Labels*

The sin of worshiping false labels essentially means fake labels. A product may use words or images, to show a third-party endorsement that doesn't exist (TerraChoice Environmental Marketing, 2010). TerraChoice found that during their study it was extremely



easy to find and purchase completely meaningless eco-labels on the internet, such as “Certified Green” to make products look more legitimate.

### ***Literature Review***

This section examines the literature looking at why greenwashing matters and the severe consequences that can result from its existence. I also look at the literature already published studying the effects of greenwashing on consumers and their perceptions of the phenomenon. From here, I was able to better determine the questions I wanted to address and discover through my own research.

### **Potential Consequences of Greenwashing**

With the green product market growing so rapidly, in turn, greenwashing follows suit (Delmas & Burbano, 2011; TerraChoice, 2010). Greenwashing is quite widespread and as a result, research shows it has significant consequences for corporations, consumers, the environment, and legitimate “green” products. This is born from the phenomenon of green skepticism.

#### ***Green Skepticism:***

Green skepticism is a unique phenomenon in which consumers have doubts about green products and their legitimacy (Leonidou & Skarmeas, 2017). It is often born from consumers who feel contradicted about a company’s performance and their advertisements because they’re using some form of greenwashing that is suspicious to the consumer (Nyilasy et al., 2013). And it’s a serious concern at that. In fact, one study found that almost half of all consumers in the US, 47%, may not actually believe environmental advertising claims (Fliegelman, 2010). However, it’s not just the US: other countries and their citizens are doubtful as well. As a result of a study

conducted in Yogyakarta, Indonesia consumers were normally quite skeptical of claims that advertise the “greenness” of a product (Aji & Sutikno, 2015). Consumers’ confusion is also growing with increases in green advertising and broad claims like “biodegradable” and “ozone friendly,” for example (ISO, 2012). More often than not, these are corporations preying on consumers who are not well versed in legitimate green labels and claims. The average consumer lacks sufficient knowledge to understand the information these claims are based on and what the guidelines are. This is bad because if consumers are confused, they’re unable to express their preferences through purchasing (ISO, 2012; Newell, Goldsmith, & Banzhaf, 1998; Stokes, 2007). However, ads can’t be too technical or descriptive otherwise consumers will probably ignore the message altogether (Paço & Reis, 2013). Green skepticism reduces consumer’s knowledge and their environmental concern as well (Goh & Balaji, 2016). Therefore, it’s a fine line to walk when dealing with green skepticism. This skepticism regarding green products among consumers can have grave consequences.

#### *Impact of Green Skepticism on Corporations:*

Due to the sharp increase in greenwashing, growing numbers of consumers are questioning corporate motives, are uncertain about product attributes, and are doubting their environmental benefits (Leonidou & Skarmeas, 2017). The use of greenwashing is found to create a lack of trust, and even a sense of betrayal, between corporations and their consumers (Wood, 2016). In some ways, this doubt can be construed as a positive thing. Green skepticism can cause consumers to seek out more information about the product through asking friends, reading certification credentials, looking at websites, and so on. It also can result in the spread of negative word of mouth to friends, which will in turn make others more aware of greenwashing (Leonidou & Skarmeas, 2017). Individuals are often influenced by other opinions, so this can

take a serious toll on someone's judgment of a product. This is useful in eliminating untruthful companies that are utilizing greenwashing. However, for the companies that are truly trying to be "green", too much skepticism can have grave consequences. In fact, findings from Nyilasy, Gergely, et al. blatantly suggest for managers to throw out the assumption green advertising can help brand attitudes and purchase intent anymore; instead it can harm them, and it may be better to stay silent, their findings indicate (2013). Corporations can even experience loss of profit if consumers are skeptical. In fact, in a study conducted in the Netherlands they found that when energy companies communicated an economic motive for an environmental investment instead of communicating an environmental motive, people were much less likely to suspect strategic behavior (de Vries, Terwel, Ellemers, & Daamen, 2015). Ideally, this wouldn't be so complicated; this makes it incredibly hard for real environmentally friendly companies to communicate their true intentions and beneficial products to people (Paço & Reis, 2013). In a perfect world, companies that actually care about the environment and lessening their impact would be able to share this without the fear of being suspected of corporate greenwashing. However, studies show companies must think carefully about how they communicate their environmental policies to consumers (de Vries et al., 2015). Companies don't want to initiate suspicion among consumers and risk losing potential business. A potential solution that has been suggested but not thoroughly researched is for a company to express environmental concern while also acknowledging economic motives as well (de Vries et al., 2015). However, not all findings make it this simple. When corporations choose to demonstrate environmental advertising in promotion of their business, findings show that this will work, but only if the focus of the environmental ad reflects the consumer's current perceptions about the corporation (Davis, 1994). If the consumers lack any prior knowledge about the company or believe the company

isn't environmentally conscious, it is more likely the environmental advertising will hurt the corporation rather than help them. Some studies advise warnings about the use of green advertising because it can lead to spending large amounts of money in order to be distinguished as "green." If consumers become skeptical this can result in a waste of funding (Leonidou & Skarmeas, 2017). It can hurt governments as well when they run campaigns and spend money to promote pro-environmental behavior but consumers are skeptical (Paço & Reis, 2013). However, not every professional emphasizes such warning for corporations who want to use green advertising. Conclusions from some studies indicate that green advertising can be used and will result in purchasing behavior, but that it is simply in their best interest to avoid false environmental claims just to create positive green brand awareness (Tariq, 2014). All that is recommended are sincere actions regarding green advertisements and consumers will make the right choices (Tariq, 2014). It seems to be a very complicated issue because how can you know how consumers will react to green advertising and what their previous notions are.

The attribution theory is recognized by several studies as a possible predictor of consumers reactions to greenwashing. The attribution theory is how "consumers explain others' behavior by 'attributing' causes to what they may observe" (Nyilasy, Gangadharbatla, & Paladino, 2012). As this applies to green advertising, Nyilasy explains that if a consumer observes the disconnect between a firm's communications and their actual behavior, they may begin to investigate why they said that and whether it is honest (Nyilasy et al., 2012). Through this study, they confirm that green advertising can harm companies. This is due to the fact that if the company is performing negatively, then green advertising yields significantly lower brand attitudes than simply using a general corporate ad (Nyilasy et al., 2012). Furlow also concludes green advertising is not as simple as it appears and that there are serious implications of using it.

Some companies even avoid advertising their positive environmental changes for fear of people thinking its greenwashing. For instance, McDonalds is trying to reduce their waste but is avoiding promoting these changes (Zmuda & Parekh, 2008.).

*Impact of Green Skepticism on Potential Green Product Innovation:*

The TerraChoice study, as well as others, show greenwashing can make consumers angry and doubtful about all environmental claims and products. Doubts can deter consumers from green purchases: often consumers attribute green advertising to companies solely trying to gain profits (Aji and Bayu, 2015). As a result, this can actually lead consumers to switch their intentions and later, switch their actual behaviors when it comes to green purchasing behaviors (Aji & Sutikno, 2015; Goh & Balaji, 2016). This also creates a lack of hope for the ability of one's purchases to lead to environmental benefits. Furthermore, this could potentially eliminate the market and/or market growth for green products and further innovation at all (Leonidou & Skarmeas, 2017; TerraChoice Environmental Marketing, 2007). Incentives for green product innovation could disappear and any further development of environmentally friendly products could come to a halt (TerraChoice; Paco and Reis). However, this is exactly what firms like TerraChoice want to discourage and are trying to do by bringing attention to greenwashing.

*Impact of Green Skepticism on Potential Environmental Benefits:*

Consumer perceptions of greenwashing are real and their impacts on brand attitudes and purchase intent are significant (Nyilasy, Gergely, et al., 2013). Another consequence that results from greenwashing is the loss of potential environmental benefit. Consumers with good intentions of purchasing green products may be misled into purchases that do not deliver on their environmental claim (TerraChoice, 2007). As a result, the potential benefit of a green purchase

disappears. TerraChoice addressed that another consequence is illegitimate environmental claims take away market share from products with true and real benefits (2007).

A lot of research out there focuses on green marketing and greenwashing, looking at either their consumer skepticism of green advertising (Paço & Reis, 2013) or the trustworthiness of labels (Parguel, Benoît-Moreau, & Larceneux, 2011). However, a different study involves the consumer's perspective of greenwashing (Brouwer, 2016). She found that, similar to other studies, consumers were skeptical of marketing messages when they were green advertising, but they also didn't completely distrust the label. In other words, consumers assumed that at the very center of it all, the information must contain some truth. This study was unique in the fact that it disclosed the sins, and when they were disclosed, people were shocked that the entirety of the label, down to its core, was entirely fake. Studies like Chen and Chang explain consumers are becoming more skeptical of labels, but Brouwer's research doesn't show this. This study found that labels were effective in persuading consumers even after they understood the sins of greenwashing (Brouwer, 2016). This led to an interesting conflict among the research I was finding that I wanted to delve into further. I felt the next logical step was to see how aware consumers are of greenwashing.

### **Consumer Awareness of Greenwashing**

Much of the literature indicates consumers are skeptical of companies using green advertising, so as mentioned previously, this led me to the question of whether consumers are able to identify greenwashing in the world around them? Some research reveals that consumers actually can't identify greenwashed ads or designs as deceptive (Krafft, 2014; Newell et al., 1998). As Krafft et. al. found, when consumers were presented with a greenwashed ad or an environmentally neutral ad, consumers considered brands more environmentally friendly if they

were greenwashed (Krafft, 2014). In my mind, a conclusion was starting to form: consumers think greenwashed ads are more environmentally friendly, but often times they are also skeptical. However, Krafft et. al. also found that consumer's attitudes toward greenwashed ads were not any more favorable than their attitudes toward ads without greenwashing; thus, they couldn't conclude that a more favorable attitude could be gained from the use of greenwashing (Krafft, 2014). Krafft et. al. also discovered that consumers were more inclined to buy a product after exposure to a greenwashed ad (2014). Interestingly enough, what Newell and his colleagues found was that environmental concern did not correlate with the ability to identify misleading environmental advertisements (Newell et al., 1998). This also was a fascinating conclusion to me: environmentalists who should theoretically be more knowledgeable, couldn't recognize the greenwashed ads. It was also found that consumers who considered themselves to be environmentally friendly had lower levels of concern with the ads, meaning they weren't evaluating the claims as they should (Stokes, 2007). This may indicate it takes more than concern for the environment, but instead education in the ability to identify misleading ads. Organizations like the FTC need to be doing more to increase consumer awareness of what deceptive environmental advertising looks like.

This leads into the interesting question of what happens if the consumers do identify the greenwashed claims or labels. Both Newell and Stokes concluded that if consumers were able to identify the deceptive ad, they had negative attitudes toward the brand, the ad itself, and toward green advertising (Newell et al., 1998; Stokes, 2007). Newell found from this that consumers who identified the ad as greenwashed had a lower intent to purchase and found the advertiser less credible (Newell et al., 1998). Stokes found that if they did not detect deception, their attitudes

were positive toward green advertising (Stokes, 2007). Consumers are in somewhat of an ignorant bliss until this phenomenon comes to light.

It's clear that often the phenomenon works even if the consumers are skeptical, but once they are aware of it, greenwashing is much harder to get away with. So, should companies do it? One study found that greenwashing is not a worthwhile strategy for organizations because consumer's intent to purchase isn't affected (De Jong, Harkink, & Barth, 2018). It is only when companies have genuine interest in protecting the environment does it seem to increase consumer purchases (De Jong et al., 2018). They also found that "greenwashing has a positive effect on the perceived environmental performance of the organization, but a negative effect on the perceived integrity of its communication" (De Jong et al., 2018). This indicates we don't fully understand how consumers react to environmental ads and labels and needs to be researched further.

## ***Methods***

Previous research highlighted the need for further investigation about consumers' perceptions of greenwashing. Some of the research said consumers were very skeptical of greenwashing and for companies not to use green advertising at all because of how detrimental it could be to their success (Leonidou & Skarmas, 2017; Nyilasy et al., 2012; Paço & Reis, 2013). However, others said that greenwashing works: they found consumers still thought the ads had some truth to them even when they didn't and thought companies were more environmentally conscious with some green label rather than none (Brouwer, 2016; Krafft, 2014; Newell et al., 1998). Krafft et. al. discovered that consumers were more inclined to buy a product after exposure to a greenwashed ad (2014), but which sins are the most effective in influencing



purchasing behavior? Given the findings of these studies and the abundant nature of greenwashing, it was a natural extension to want to discover more about consumer's understanding of greenwashing.

## **Hypotheses**

In my research I wanted to test some of these claims others had already tested to see if my results aligned with theirs or not. I wanted to see primarily, if greenwashing works: if consumers believe a product with a greenwashed label is more sustainable than a product without. I also wanted to test whether consumers are skeptical of a greenwashed label's claims and if those claims influence their purchase intent. Finally, I wanted to know whether consumers are aware that a product's label is greenwashed. In my data collection, I will test the following hypotheses:

**H1** Consumers will believe a product is more sustainable if the product has a greenwashed label than a product that does not.

**H2** Consumers will be skeptical and untrusting of a greenwashed label on a generic product.

**H3** Consumers will have varying purchase intents based on the sin of the greenwashed label.





**H4** Consumers will believe greenwashing is problematic but will not be able to identify a greenwashed label.

In addition to these hypotheses, I wanted to look at several exploratory questions that weren't really addressed in any of the research I found. It peaked my interest to get consumers

perspective of greenwashing on whether it was problematic and whether they believe it's common. Much of the literature discussed how it affected consumers including their views of products, their views of companies, their trust, and their purchase intents. However, my curiosity stretched beyond these questions and beyond consumers being able to identify greenwashing. I wanted to know if they really know how common it is in our world today and how worried they are about it being a problem. This could lead to increased awareness measures if they do believe it's a problem.

## **Research Design**

In order to test these hypotheses, I used a quantitative research method to collect primary data. The structure for this study is attributed to TerraChoice and their "Seven Sins" of Greenwashing (2010). I identified, of the seven, the three "sins" that were most crucial and those for which I could test consumer's awareness. Thus, I chose to test the 'Sin of Irrelevance', the 'Sin of Vagueness' and the 'Sin of Worshipping False Labels' (2010). In order to do so, I picked a generic product common to both men and women that ultimately could be a product people look for green alternatives. One image of the shampoo bottle lacked any label to act as a control for the study. The other three images contained a label displaying one of three sins of greenwashing (TerraChoice, 2010). The first was a label claiming, "No CFCs" to represent the 'Sin of Irrelevance'. The second was a generic recycling label with no additional information to represent the 'Sin of Vagueness.' Finally, the third was a label TerraChoice had discovered during their study that was faulty and could be purchased on the internet without completing any certification requirements for a very low price. The label says, "Certified Green Environmentally Conscious" and represents the 'Sin of Worshipping False Labels'. The images that were shown for each sin are displayed in Table 1 below.

Table 1. Images shown to participants during survey (Labels from TerraChoice)				
Sin	Control (No sin)	Sin of Irrelevance	Sin of Vagueuess	Sin of Worshipping False Labels
Image				

Every respondent was first asked to fill out a consent form. If they accepted, everyone answered a series of demographic questions and several questions about their environmental lifestyle. Then, of the four groups, each respondent was randomly assigned to one of the four conditions: an image with a sin or the control. They were all asked to evaluate the message by answering a series of questions. For the control, the respondent was asked to answer questions about certain attributes of the product including how informative, attractive, sustainable, high quality, trustworthy and appealing it was. They also answered a question about how

environmentally friendly they would consider the product to be. Those who received the images with one of the sin-committing labels answered those same questions, as well as ones about the trustworthiness of the label and likelihood of the label to influence their purchasing decisions. Each respondent, control or not, was then brought to the qualitative evaluation portion of the survey. Here there were two open-ended questions in which I was able to gather information on why they responded in the manner they did as far as the greenness of the product and whether the label or lack thereof was helpful in making a judgement about environmental friendliness of the product. The last portion of the survey brought each respondent in all conditions to a new page and gave them a brief description of what greenwashing is in general (See Survey in Appendix Materials) and how this study is designed to test their awareness of this phenomenon. This description was followed by three questions in which I asked whether the participant thought the packaging they received was greenwashing, whether they believe greenwashing in general is a problem, and how common they think it is. This brought the participants to the end of the survey and a debriefing message in which each participant was told the purpose of the study was to help me understand the extent to which consumers are aware and understand several different types of greenwashing.

## **Participants**

In order to identify participants for the purpose of my study, I used my social network and outreach of various sorts to distribute my survey. There were 414 total respondents of which 368 participated and completed the survey fully. The study was approved by the University of Colorado's Institutional Review Board (IRB) for compliance with Human Subjects Research. Subjects were informed that the purpose of the study was to answer questions about their attitudes and beliefs about companies and products' environmental claims. The survey took 5 to

10 minutes to complete. The subjects were informed the study was voluntary and they could stop participation at any time without consequences. They were also told that the information was completely anonymous and confidential; there was no incentive offered as a result of participation in my study.

## **Variables**

Several variables were used in this study to understand consumer's perceptions of greenwashing. My independent variable, that remained the same for each group of participants was the sin they were assigned. Depending on the condition it was one of three sins: the Sin of Vagueness, the Sin of Irrelevance, and the Sin of Worshipping False Labels. The last independent variable was the control, which lacked any sin (no label). The dependent variables were: perceptions of product sustainability, trustworthiness of the product as a whole, trustworthiness of the label, overall perception of the product, purchase intent, and perceptions of greenwashing. Perceptions of greenwashing included their ability to identify the packaging as a case of greenwashing, their belief that greenwashing is problematic, and their belief that greenwashing is common.

## **Data**

In order to analyze the collected data, I first cleaned the data in Excel to eliminate any invalid or unfinished responses. Then, I imported the data into a program called SPSS Statistics. This program served as my primary mode of statistical analysis, so I could examine the relationships across the various sins for each variable, as well as the relationships across variables. After importing the data, I used SPSS to run a series of analyses of variance (ANOVAs) to examine the impact of sin condition on each of the dependent variables.

First, I ran a One-way ANOVA to ensure there was no other reason besides what I manipulated for the differing between each sin as far as gender, income, education, political affiliation, and age. Then I ran several different ANOVAs to compare the means between each sin and the different variables: perceptions of product sustainability, trustworthiness of the product as a whole, trustworthiness of the label, overall perception of the product, purchase intent, and perceptions of greenwashing. I did this also to determine if the relationship between the means was statistically significant. I did so by using SPSS to calculate the p-value and for this study a significance level of 5% was used. Thus, when the p value was less than 0.05, I concluded that the relationship was significant with a 95% confidence level. I also used Excel to create all of the graphs and charts in which I could show the means and the standard error for each variable against all sins.

## ***Results***

In total, there were 414 participants from across the United States. However, 368 of those fully completed the survey and were used in the analyses presented below. This section is meant to give an understanding of the data collected from the survey respondents. First, it is important to examine the demographic information of the participants in my study. This meant looking at the distribution of gender, age, education, political affiliation, household income within the last year before taxes, and level of environmentalism. The overall level of environmentalism was found by averaging the scores of three questions in the survey about their environmental lifestyle. The questions were about the extent to which they identify as an environmentalist, how important is it for them to strive to live a sustainable lifestyle, and when purchasing products how often they look for green alternatives.

Figure 1 gives an overview of the participants' demographic information. It is possible to see the number of participants in each category within a demographic group and what those percentages look like.

<b>Figure 1. Demographic Information</b>		
	<b>Count</b>	<b>Percentage</b>
<b>Gender</b>		
Male	87	23.84%
Female	278	76.16%
<b>Total</b>	<b>365</b>	<b>100%</b>
<b>Age</b>		
18-24	119	32.4%
25-44	139	37.9%
45-64	89	24.3%
65 and older	15	4%
<b>Total</b>	<b>362</b>	<b>98.6%%</b>
<b>Education</b>		
Completed some highschool	3	0.82%
Highschool graduate	13	3.55%
Some college	106	28.96%
Associate's degree	20	5.46%
Bachelor's degree	113	30.87%
Graduate or professional degree	111	30.34%
<b>Total</b>	<b>366</b>	<b>100.00%</b>
<b>Political Affiliation</b>		
Democrat	129	35.25%
Republican	50	13.66%
Independent	35	9.56%
Independent, lean Republican	38	10.38%
Independent, lean Democrat	82	22.40%
None	20	5.46%
Other	12	3.29%
<b>Total</b>	<b>366</b>	<b>100.00%</b>
<b>Total Household Income before Taxes (last year)</b>		
None	15	4.13%
Less than \$25,000	61	16.80%
\$25,000 to \$34,999	16	4.41%
\$35,000 to \$49,999	44	12.12%
\$50,000 to \$74,999	45	12.40%
\$75,000 to \$99,999	36	9.92%
\$100,000 to \$149,999	66	18.18%
\$150,000 to \$199,999	44	12.12%
\$200,000 or more	36	9.92%
<b>Total</b>	<b>363</b>	<b>100.00%</b>

Figure 2 demonstrates the distribution of participants' gender. As you can see, the ratio of males to females is slightly over 1:3.

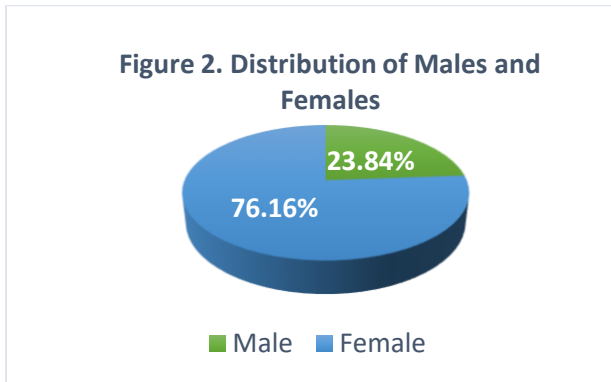
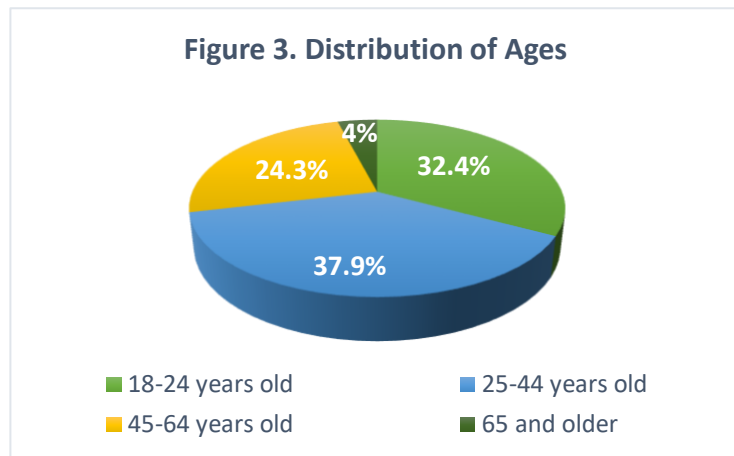


Figure 3 displays the distribution of age among the participants in my study. Within SPSS, I grouped the ages into four categories based on how they are organized for the Census. The majority of participants, in fact slightly over one-third of them, fell into the 25-44 years old age range. However, the 18-24 years old range





and 45-64 years old range also made up almost one-third each. The fewest respondents by far fell into the 65 and older age range.

Figure 4 demonstrates the distribution in levels of education among participants. There were six categories,

but the highest

education level with

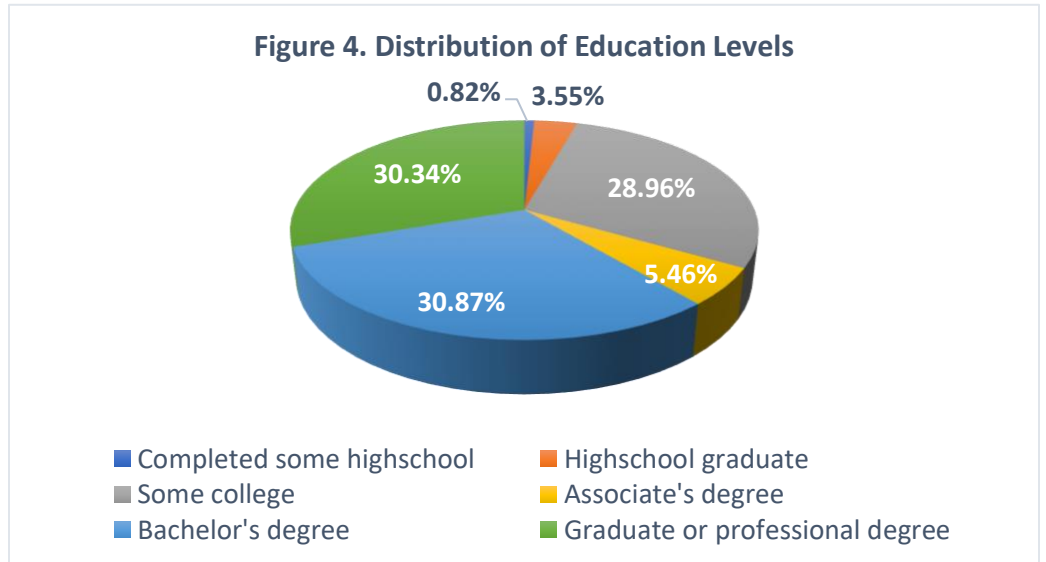
the most respondents

was “Bachelor’s

degree” and just below

that was “Graduate or

professional degree.”



This made up over 60% of responses which indicates a very educated sample. A large percentage

of other responses were “Some college” which could imply many of the participants are still in college. A very small percentage responded, “High school graduate” or “Associate’s degree.”

Figure 5 displays the distribution of various political affiliations among participants.

There were seven categories the respondents fell into. Overall, I had a slightly more Democratic

sample. The largest

percentage of participants

chose “Democrat” and the

second largest percentage

chose “Independent, lean

Democrat.” This may be

because of the age of

individuals in my social

network, as well as their

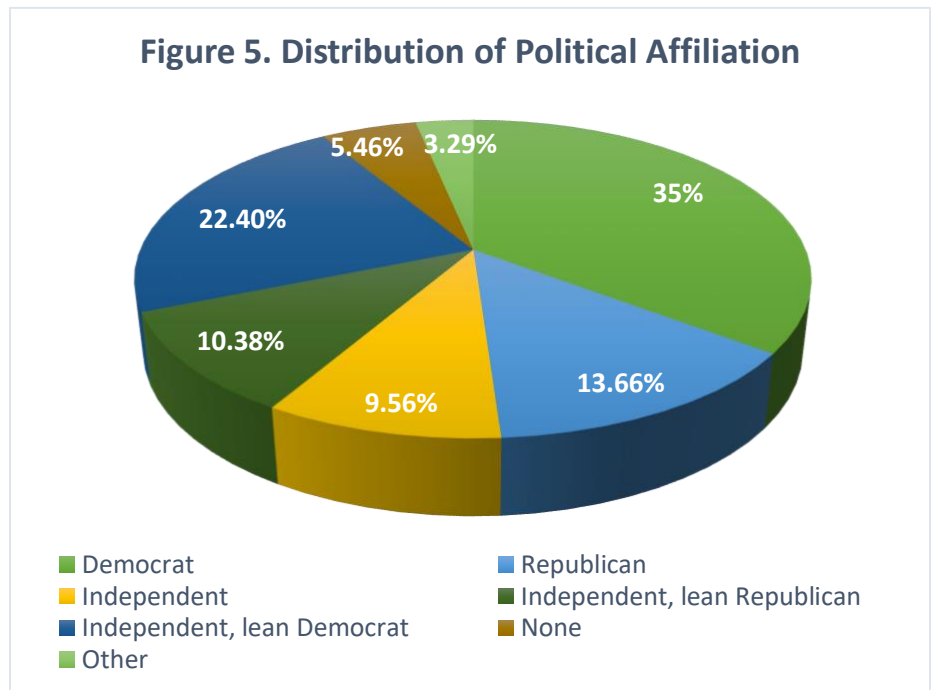
location. However, there was

still a significant percentage of individuals who responded, “Republican,” “Independent, lean

Republican,” and “Independent.” Very few chose “Other” or “None.”

Figure 6 categorizes the participants based on the “Distribution of Total Household

Income before Taxes (last year).” There were 9 categories and the participants were distributed



fairly evenly among all nine groups. The \$100,000 to \$149,999 bracket was the largest category with 18.18% of participants. The least number of respondents were in “None” category.

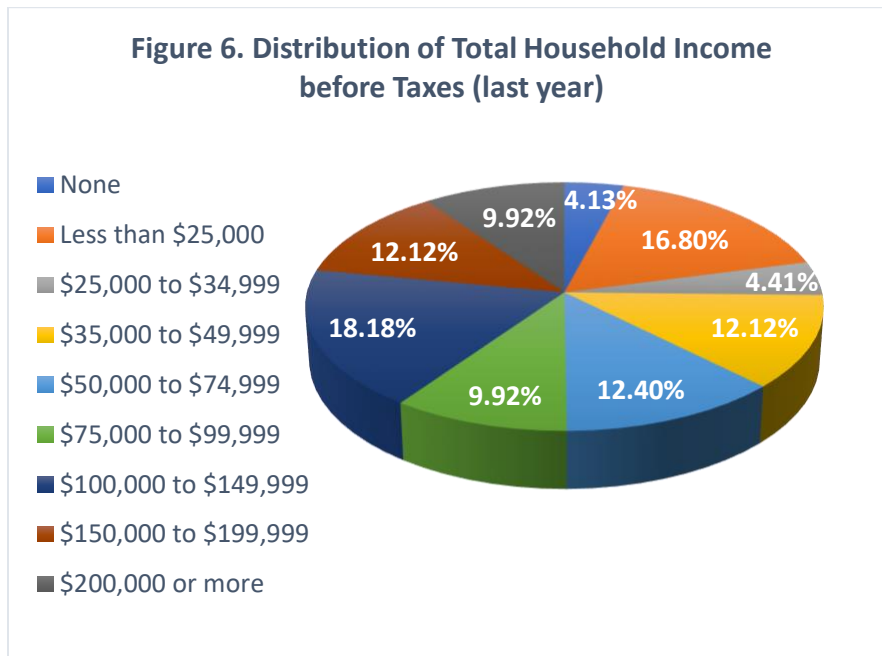


Table 2 displays information about the demographic groups and how they were distributed across the four conditions. I have presented the number of participants assigned to

Table 2. Distribution of Demographic Groups Across Sins	Control (No sin) (N = 91-93)		Sin of Irrelevance (N = 86-87)		Sin of Vagueness (N = 95-97)		Sin of Worshipping False Labels (N = 89-90)		Overall (N = 363-367)		Statistical Significance
	Mean (SD)	Range	Mean (SD)	Range	Mean (SD)	Range	Mean (SD)	Range	Mean (SD)	Range	F, p-value
Gender	1.79 (.41)	1-2	1.72 (.45)	1-2	1.76 (.43)	1-2	1.77 (.43)	1-2	1.76 (.43)	1-2	.40, p=.76
Age	34.44 (14.35)	17-73	36.51 (15.46)	17-74	36.38 (14.14)	18-72	36.03 (15.73)	17-75	35.84 (14.88)	17-75	.37, p=.77
Education	4.60 (1.40)	1-6	4.60 (1.33)	1-6	4.67 (1.22)	1-6	4.24 (1.32)	1-6	4.53 (1.32)	1-6	1.92, p=.13
Student	1.67 (.47)	1-2	1.69 (.47)	1-2	1.68 (.47)	1-2	1.62 (.49)	1-2	1.66 (.47)	1-2	.34, p=.79
Political Affiliation	2.73 (1.83)	1-6	3.02 (1.95)	1-6	3.08 (1.88)	1-6	3.19 (1.91)	1-6	3.01 (1.89)	1-6	.99, p=.40
Income (last 6 months)	5.16 (2.42)	1-9	5.67 (2.54)	1-9	5.31 (2.31)	1-9	5.26 (2.44)	1-9	5.34 (2.42)	1-9	.75, p=.52
Overall Level of Environmentalism	3.16 (.73)	1-5	3.29 (.87)	1-5	3.22 (.84)	1-5	3.24 (.79)	1-5	3.22 (.81)	1-5	.42, p=.74

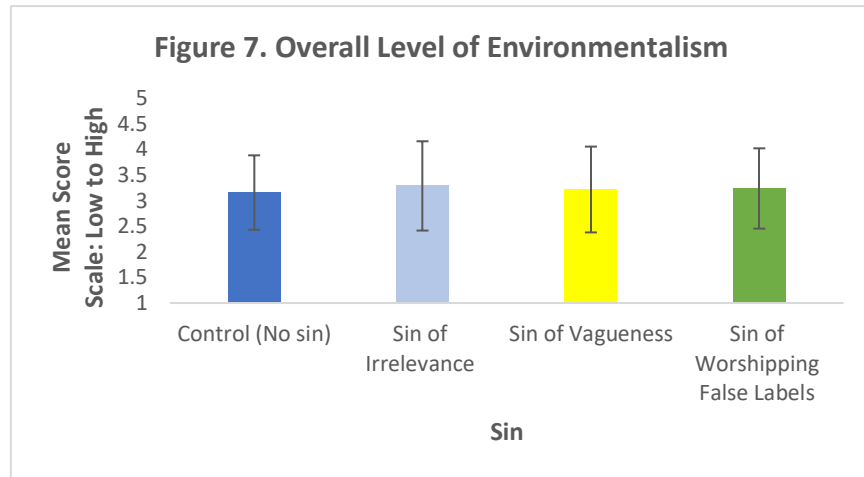
Note: A One-way ANOVA was used to test the significant difference across conditions and none were found.

each sin, as well as the mean, standard deviation, range, and statistical significance of each group. As you can see, I did this for age, gender, education, political affiliation, whether they are a student, their income, and their level of environmentalism. I also ran a One-way ANOVA to

test the significant difference across the conditions, but none were found. This table also displays the F and p-values.

Figure 7 shows the Overall Level of Environmentalism of participants across the four conditions. These

values were found by finding the means of participants sustainable lifestyle choices, their intent to purchase green products, and how



much of an environmentalist they believe themselves to be. Overall, the participants level of environmentalism was distributed fairly evenly across each of the four conditions. These questions were asked before the participant was shown any condition. The scale ranged from 1-5 with all of the averages being slightly above 3. Therefore, the participants in this survey were more environmentally conscious on average than not.

The next part of the results involves looking more closely at the extent to which key variables of interest varied across the sin conditions. The dependent variables described below are: overall perception of the product, trustworthiness of the product as a whole, trustworthiness of the label, purchase intent, various perceptions of greenwashing, and perceptions of product sustainability. Before looking too in depth at the analysis of the variables, it is helpful to look at

the variables as they appeared in my survey. You can see this displayed in Table 3 shown below. Here, you can also see the overall mean and standard deviation for each variable.

Table 3. Summary of Dependent Variables as They Appeared in Survey

Dependent Variable Name	Item (s)	M (SD)
Overall Perception of the Product	Please rate this product on various features. To what extent do you consider this product: Attractive, Sustainable, Informative, Trustworthy, High Quality, Appealing (1=Not at all; 5=Very)	2.25 (.79)
Perceptions of Product Sustainability	Average of: To the best of your knowledge, how environmentally friendly would you consider this product? & To what extent do you consider this product: Sustainable (1=Not at all; 5=Very)	2.41 (.92)
Trustworthiness of Product	Please rate this product on various features. To what extent do you consider this product: Trustworthy (1=Not at all; 5=Very)	2.16 (.96)
Trustworthiness of Label	To what extent do you trust the " _____ " label provided on the product? (1=Not at all; 5=A lot)	2.97 (.97)
Purchase Intent	Would seeing this label make a difference in your decision to purchase it? (1=Much less likely; 7=Much more likely)	4.64 (1.01)
Ability to Identify Product as a Case of Greenwashing	In your opinion, do you think this packaging was a case of greenwashing? (1=Not at all; 5=Extremely)	2.57 (1.15)
Commonness of Greenwashing	In your opinion, how common do you think greenwashing is? (1=Not at all; 5=Extremely)	3.68 (.82)
Is Greenwashing Problematic?	Do you think greenwashing is a problem? (1=Not at all; 5=Extremely)	3.67 (1.01)

Next, I ran a series of analyses of variance (ANOVAs) to examine the impact of the sin condition on each of the dependent variables. A summary of these results is provided in Table 4, as are the means, standard deviations, and range. I have also plotted the means of each dependent

variable by condition in Figures 8 and 9. The only variable that wasn't statistically significant was purchase intent due to label.

Table 4. Distribution of Variables Across Sins Dependent Variables	Control (No sin) (N = 83 – 93)		Sin of Irrelevance (N=75-87)		Sin of Vagueness (N = 85-97)		Sin of Worshipping False Labels (N = 79-90)		Overall (N = 274-367)		Statistical Significance
	Mean (SD)	Range	Mean (SD)	Range	Mean (SD)	Range	Mean (SD)	Range	Mean (SD)	Range	F, p-value
Overall Perception of Product	1.93 (0.67)	1-5	2.37 (0.86)	1-5	2.20 (0.75)	1-5	2.51 (0.77)	1-5	2.25 (.79)	1-5	9.99, p=0
Trustworthiness of Entire Product	1.92 (0.92)	1-5	2.43 (.95)	1-5	1.94 (.86)	1-5	2.39 (1.00)	1-5	2.16 (.96)	1-5	8.01, p=0
Trustworthiness of Label	-	-	2.98 (.99)	1-5	3.14 (1.010)	1-5	2.77 (.86)	1-5	2.97 (.97)	1-5	3.64, p=0.03
Purchase Intent due to Label	-	-	4.59 (1.15)	1-7	4.64 (1.03)	1-7	4.68 (.82)	1-7	4.64 (1.01)	1-7	.18, p=.83
Perceptions of Product Sustainability	1.73 (.70)	1-5	2.53 (.88)	1-5	2.51 (.82)	1-5	2.91 (.87)	1-5	2.41 (.92)	1-5	33.99, p=0
Ability to Identify Packaging as Greenwashing	1.50 (0.92)	1-5	2.83 (0.99)	1-5	2.84 (1.07)	1-5	3.20 (0.807)	1-5	2.57 (1.15)	1-5	51.90, p=0
Is Greenwashing Problematic?	3.38 (1.01)	1-5	3.72 (1.05)	1-5	3.71 (1.07)	1-5	3.87 (0.85)	1-5	3.67 (1.01)	1-5	3.55, p=0.02
Commonness of Greenwashing	3.46 (0.89)	1-5	3.72 (0.86)	1-5	3.79 (0.79)	1-5	3.76 (0.72)	1-5	3.68 (.82)	1-5	2.85, p=0.04

Part A of Figure 8 plots the overall perceptions of the product for various sins. As you can see, participants had a higher general perception of the product if they were shown any one of the three labels compared to the control. In Figure 8 Part E, a similar trend emerges—individuals had higher perceptions of product sustainability if the product had a label, than if it didn't. Thus, I can conclude that having a label matters for individuals' perception of the product. There is also some evidence that the Sin of Worshipping False Labels convinced participants the product was more trustworthy, more sustainable, and had a higher overall perception than the Sin of Vagueness. The Sin of Worshipping False Labels was also slightly higher than the Sin of Irrelevance, although not statistically significant. Nonetheless, there was some evidence that this was the most effective label. From this I can conclude that the type of label often matters in how consumers view the product.

Part C of Figure 8 shows the means of trustworthiness of the label across the three label conditions (excluding the control). Control wasn't included because there was no way to ask participants their trustworthiness of a label that wasn't present. Overall, the average

trustworthiness of the labels for each sin was higher than 1 or 2, meaning none of the labels were found to be untrustworthy by participants. Also, interestingly, the Sin of Worshipping False Labels was also perceived to be less trustworthy than the Sin of Vagueness and, to some extent, the Sin of Irrelevance (although this difference wasn't statistically significant). In addition, although the Sin of Worshipping False Labels seemed to have the biggest impact on product perceptions, there was no difference in purchasing intent across label conditions. It is noteworthy that participants found the Sin of Worshipping False Labels to be less trustworthy, but they didn't act on that suspicion in terms of their perceptions of the product or their purchasing intent.

In Figure 8 Part D it is also worth noting that the difference in purchase intent for each sin was not statistically significant from one another. However, the average purchase intents were quite high for every sin, although not statistically significant. Purchase intent was not collected for the control because it was the likelihood of the label to influence the participants purchasing intent.

Figure 9 shows additional results from the primary analysis looking at the participants' perceptions of greenwashing. In the survey, participants were given these questions after the ones about product perceptions. In the product perception section, presented above, participants were not yet given any information about greenwashing. Before the greenwashing perception section, participants were given a brief description of the phenomenon (see survey in Appendix materials).

It is clear from Figure 9 Part A and Part C that seeing any environmental label made participants' suspicious of greenwashing. Again, as shown in Figure 8, Figure 9 shows that having a label matters in participants' perceptions of greenwashing. The trend also emerges here that the Sin of Worshipping False Labels is different from the other two sins. People who had

that label thought greenwashing was the most problematic and also thought it was more of a case of greenwashing than participants' who were assigned the other two sins. Furthermore, the Sin of Irrelevance and the Sin of Vagueness also oddly exemplified similar results across many variables including participants' belief that greenwashing is problematic, their ability to identify the product as a case of greenwashing, and their belief of how common greenwashing is. This may mean these sins are correlated. I can conclude that people thought all of these labels were cases of greenwashing, but they were still successful in persuading individuals that the product had a higher general value, that the label was trustworthy, and that the product was more sustainable. However, after getting the brief description of greenwashing, participants were more perceptive to it, which may indicate why drawing consumers' attention to the problem of greenwashing in the real world could be so important. These findings were fascinating and led me to analyze my results further by examining certain demographic groups.

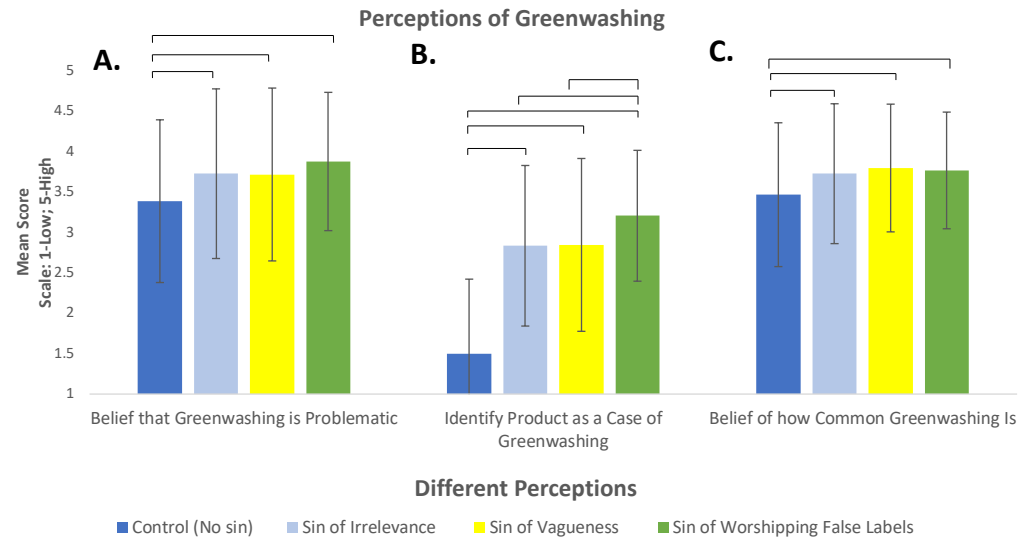


**Figure 8.** Effect of Sin across Dependent Variables



**Note.** This figure shows the variables of overall product perception, trustworthiness of the product, trustworthiness of the label, purchase intent due to the label, and the perceptions of product sustainability across the sins. The bars show a mean difference that is statistically significant at a 0.05 level. Error bars represent the standard error around the mean.

**Figure 9.** Effect of Sin across Dependent Variables



**Note.** This figure shows the variables of participants' belief that greenwashing is problematic, their ability to identify the product as a case of greenwashing, and their belief of how common greenwashing is across the sins. The bars show a mean difference that is statistically significant at a 0.05 level. Error bars represent the standard error around the mean.

## Supplementary Analysis

In addition to the findings above, it seemed necessary to analyze the results further. I chose age and environmentalism as two variables I wanted to examine. I ran an ANOVA in which I included as predictors both the sin condition and the effect of levels of environmentalism. First, I gave each person an average score based on their responses to the three questions about environmental lifestyle in the survey. I created a new variable for the environmentalists in which they were split up into Low, Moderate, and High Environmentalists; those who had an average between 1-2.5 were Low, those who had an average of 2.51 to 3.5 were Moderate, and 3.51 to 5 were High. This was how I determined it would be best to look at the relationship. I narrowed my analyses to five key dependent variables: perceptions of product sustainability, their trustworthiness of the label, their ability to identify the product as a case of greenwashing, their belief greenwashing is a problem, and their belief that greenwashing is common. I then ran the analyses. Table 5 summarizes the results of these models. The means broken down by levels of environmentalism and sin for all dependent variables are shown in Figure 10.

	Perceptions of Product Sustainability		Trustworthiness of Label		Ability to Identify Product as a Case of Greenwashing		Is Greenwashing Problematic?		Commonness of Greenwashing	
	F	p-value	F	p-value	F	p-value	F	p-value	F	p-value
Sin	28.94	0	3.52	0.03	45.53	0	3.5	0.02	2.74	0.04
Environmentalism	2	0.14	1.48	0.23	6.41	0	17.04	0	3.72	0.03
Sin X Environmentalism	2.16	0.05	0.16	0.96	0.23	0.97	0.4	0.88	0.38	0.89

### *Environmentalism*

First, for perceptions of product sustainability, there was a main effect of sin, no main effect of environmentalism, and a significant sin by environmentalism interaction effect. This

shows that, for perceptions of product sustainability, it mattered whether or not there was a sin present. There was no statistically significant main effect of environmentalism, indicating varying levels of environmentalism didn't mean participants had higher or lower perceptions of product sustainability depending on which level they were. However, the interaction effect of sin by environmentalism is more complex. This indicates the effectiveness of the sin, shown in Figure 10 Part A. The sins were less effective for high levels of environmentalism in participants. This was true for the Sin of Irrelevance and the Sin of Worshipping False Labels, but especially for the Sin of Vagueness.

Second, for trustworthiness of the label, there was a main effect of sin, no main effect of environmentalism, and no significant sin by environmentalism interaction effect. It is clear that with trustworthiness of the label, it depended on which label participants had that determined their trust. It appears the Sin of Vagueness was the most trusted by Low, Moderate, and High levels of environmentalism shown in Figure 10 Part B. However, no matter the level of environmentalism participants trusted the labels at a fairly equivalent level.

Third, for ability to identify the product as a case of greenwashing, there was a main effect of sin, a main effect of environmentalism, and no significant sin by environmentalism interaction effect. It was dependent on whether individuals had a sin if they were able to identify the product as greenwashing. It is also shown that higher levels of environmentalism are more able to identify products as a case of greenwashing than low levels of environmentalism. This is shown in Figure 10 Part C.

Next, for greenwashing being problematic, there was a main effect of sin, a main effect of environmentalism, and no significant sin by environmentalism interaction effect. This means that having a sin caused participants to believe that greenwashing was more problematic. The main

effect of environmentalism means that participants with high levels of environmentalism were more concerned with greenwashing being problematic. This trend is shown in Figure 10 Part D.

Finally, for the commonness of greenwashing, there was a main effect of sin, a main effect of environmentalism, and no significant sin by environmentalism interaction effect. This means that having a sin caused participants to believe that greenwashing was more common. The main effect of environmentalism means that participants with high levels of environmentalism thought greenwashing was more common. This is shown in Figure 10 Part E.

Thus, I can conclude that sin mattered across all five of these variables. It matters whether a label is present or not for perceptions of product sustainability, their trustworthiness of the label, their ability to identify the product as a case of greenwashing, their belief greenwashing is a problem, and their belief that greenwashing is common.

I also can conclude that strong environmentalists are more perceptive of greenwashing. They were more able to identify it, believe its problematic, and believe its common. This contradicts what Newell and his colleagues found: that environmental concern did not correlate with the ability to identify misleading environmental advertisements (Newell et al., 1998). For Figure 10 Part E, all levels of environmentalists thought greenwashing was common. This shows people were skeptical and could recognize greenwashing, but even for high environmentalists it still worked. It was also intriguing that of the three sins, environmentalists overall didn't "buy" the Sin of Vagueness more so than the other two sins. Additionally, I found that strong environmentalists thought greenwashing was more common and problematic than those who did not exhibit strong levels of environmentalism. This contradicts what previous research discovered; they uncovered that consumers who considered themselves to be environmentally

friendly had lower levels of concern with the ads, meaning they were inhibited from evaluating the claims correctly (Stokes, 2007).

*Age*

Next, I replicated these analyses, but to examine the relationship between age and sin. I divided the participants into four age groups and created a new variable that divided the participants into 18-24, 25-44, 45-64, or 65 and older. I then ran an ANOVA with age group and sin condition as predictors of the five same variables listed above. My focus was drawn to looking primarily at the comparison between older and younger individuals. Results are summarized in Table 6 and Figure 11.

	Perceptions of Product Sustainability		Trustworthiness of Label		Ability to Identify Product as a Case of Greenwashing		Is Greenwashing Problematic?		Commonness of Greenwashing	
	<i>F</i>	<i>p-value</i>	<i>F</i>	<i>p-value</i>	<i>F</i>	<i>p-value</i>	<i>F</i>	<i>p-value</i>	<i>F</i>	<i>p-value</i>
Sin	13.73	0	0.39	0.68	7.13	0	1.2	0.31	1.99	0.12
Age	3.81	0.01	2.76	0.04	0.73	0.54	4.91	0	4.78	0
Sin X Age Group	1.08	0.38	1.52	0.17	2.09	0.03	0.6	0.8	0.69	0.72

First, for perceptions of product sustainability, there was a main effect of sin, a main effect of age, and no significant sin by age interaction effect. Shown in Figure 11 Part A, you can see the main effect of age where the youngest two age groups saw the products as more sustainable than the 45-64 year olds; this middle group was the most suspicious. The group that thought the products were the most sustainable though, were the oldest individuals (65 and older).

Second, for trustworthiness of the label, there was no main effect of sin, a main effect of age, and no significant sin by age interaction effect. In Figure 11 Part B you can see that older

individuals were the most trusting of the labels. The middle group of 45-64 year olds were the most suspicious.

Third, looking at ability to identify the product as a case of greenwashing, there was a main effect of sin, no main effect of age, and a significant sin by age interaction effect. Among the 18 to 64 year olds, receiving a label led to the perception that the product was greenwashed. However, among those older than 65, they perceived the product to be greenwashed irrespective of whether a label was present. Those over 65 were also particularly sensitive to the Sin of Vagueness; in this condition older individuals were more convinced that the product was greenwashed relative to the other two sin conditions. It is important to note there are relatively few individuals in this sample over the age of 65. Therefore, these results should be interpreted with caution.

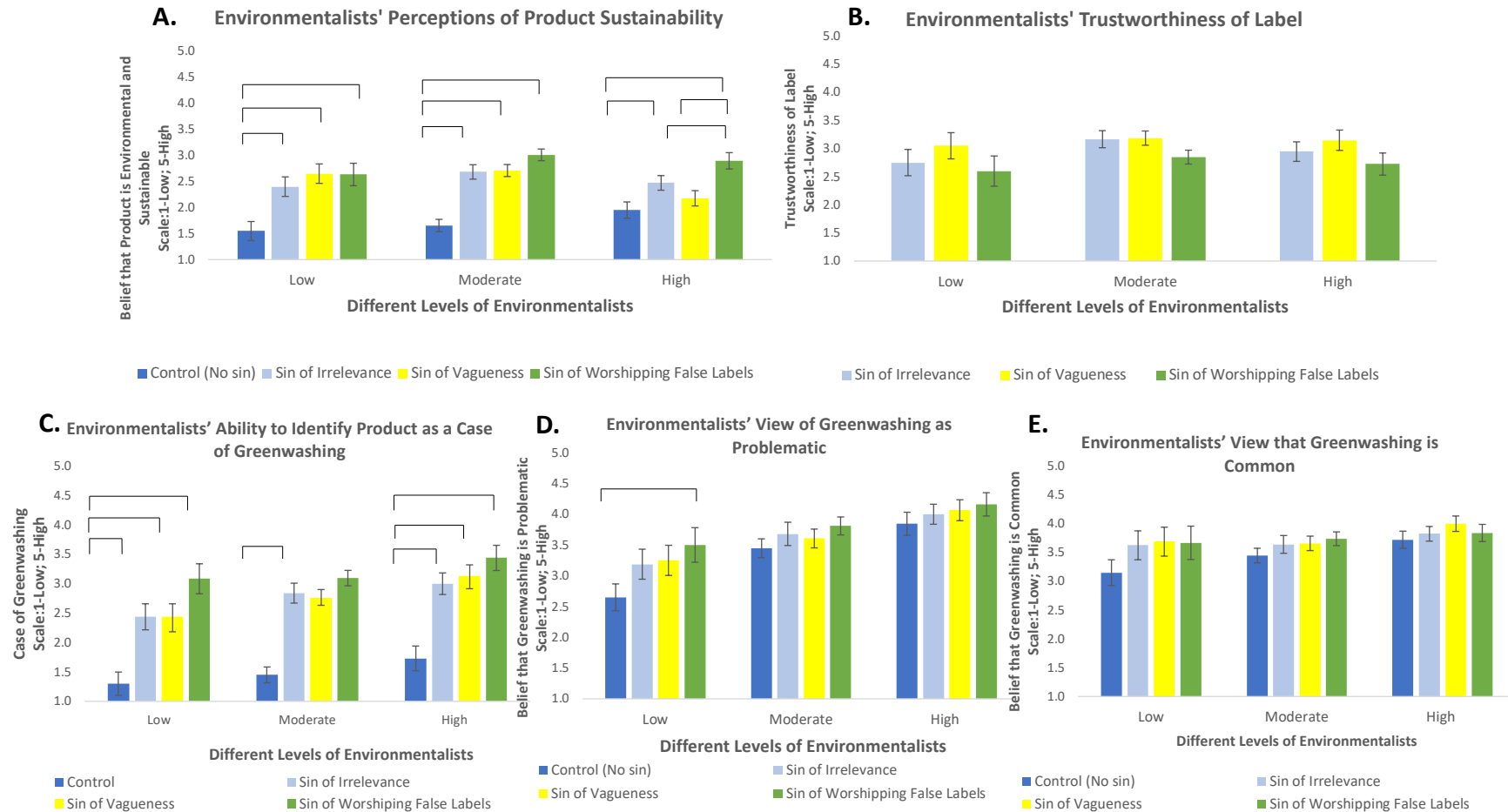
In addition, looking at greenwashing being problematic, there was no main effect of sin, a main effect of age, and no significant sin by age interaction effect. In Figure 11 Part D you can see that older individuals are less concerned with greenwashing. This makes sense for the fact that the oldest individuals were the most trusting of the labels. The younger individuals were the most concerned with greenwashing being a problem, but the older people got, the less concerned they were.

Similarly, for greenwashing being common, there also was no main effect of sin, a main effect of age, and no significant sin by age interaction effect. Figure 11 Part E shows the same trend as discussed above: the older the individuals got, the less common they thought greenwashing was. However, from Figure 11 Part D and E, it is clear all age groups overall, no matter the sin, thought greenwashing was problematic, as well as common.

From these analyses regarding age, I can conclude that older individuals are more trusting of labels and less concerned with greenwashing as a whole than younger groups. However, greenwashing really worked on both of the younger age groups in that it made them think the product was more sustainable. Also, some sins are more convincing than other and that varies depending on the target audience.

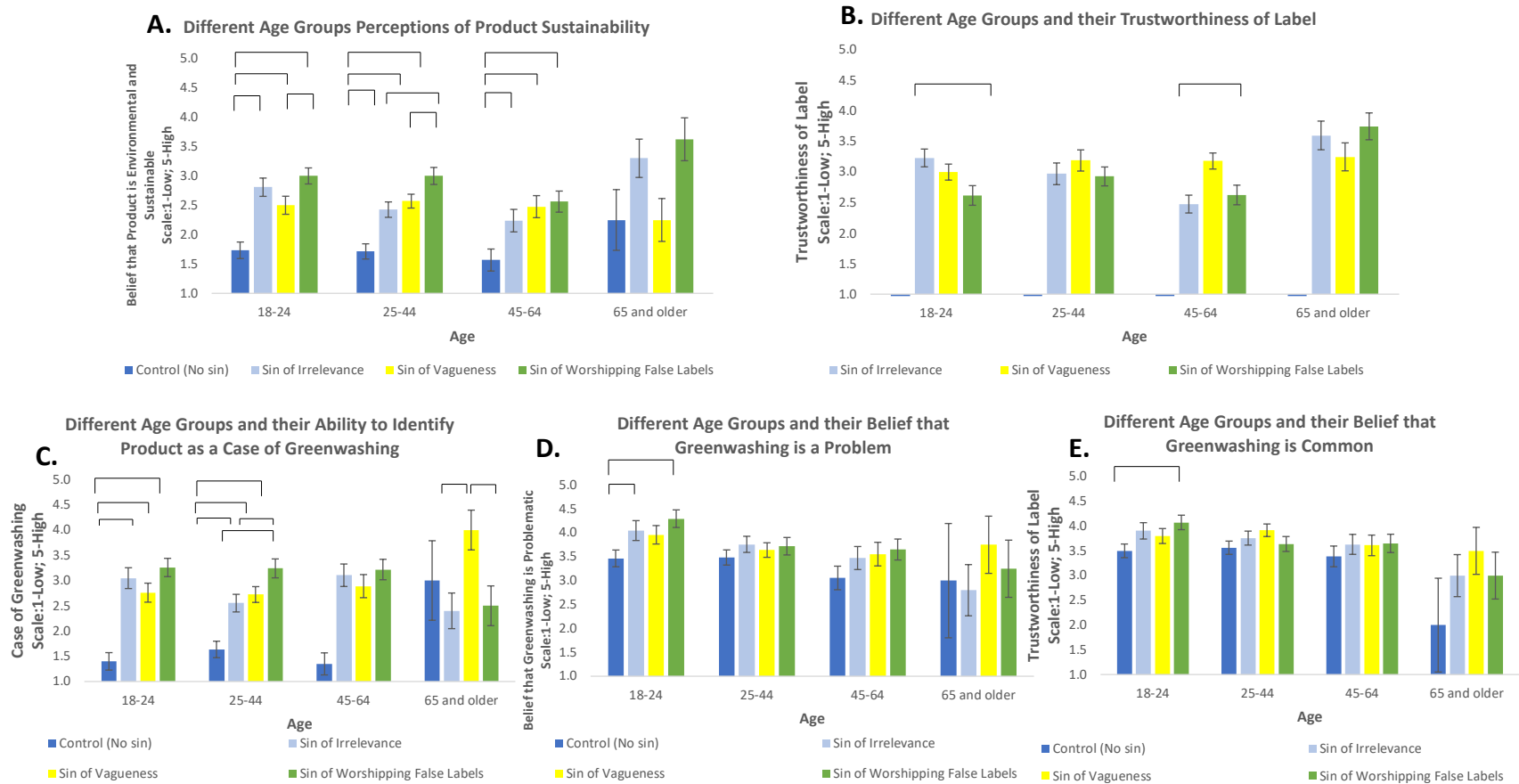


**Figure 10.** Sin condition and the effect of levels of environmentalism across dependent variables.



**Note.** This figure shows different levels of environmentalists compared with participants' perceptions of product sustainability, trustworthiness of the label, belief that greenwashing is problematic, their ability to identify the product as a case of greenwashing, and their belief of how common greenwashing is across the sins.. The bars show a mean difference that is statistically significant at a 0.05 level. Error bars represent the standard error around the mean.

**Figure 11.** Sin condition and the effect of age across dependent variables.



**Note.** This figure shows different age groups compared with participants' perceptions of product sustainability, trustworthiness of the label, belief that greenwashing is problematic, their ability to identify the product as a case of greenwashing, and their belief of how common greenwashing is across the sins.. The bars show a mean difference that is statistically significant at a 0.05 level. Error bars represent the standard error around the mean.

## ***Discussion***

The results from my study yielded some particularly interesting trends. In several cases my hypotheses held true and in other cases, they did not.

First, looking at **H1**: Consumers will believe a product is more sustainable if the product has a greenwashed label than a product that does not. In all cases this was true: having a label, even one that was greenwashed, worked and was successful in convincing participants that the product was more sustainable. These results compliment the results found by Krafft et. al. In that study, when consumers were presented with a greenwashed ad or an environmentally neutral ad, consumers considered brands more environmentally friendly if they were greenwashed (Krafft, 2014).

Next, looking at **H2**: Consumers will be skeptical and untrusting of a greenwashed label on a generic product. This didn't hold true overall. If skepticism is measured as being a 1 or a 2 on a 1-5 scale (1 being not at all and 5 being very), overall, participants were over this level for every sin in my results. This was the same for all age groups and all levels of environmentalism as well. By no means were participants on average around a 4 or 5 level, but they weren't as skeptical as I had predicted. This indicates that H2 did not hold true. This is not consistent with much of the other literature out there. Previous research says consumers were very skeptical of greenwashing and that companies shouldn't use green advertising at all anymore because of how detrimental it could be to their success (Leonidou & Skarmeas, 2017; Nyilasy et al., 2012; Paço & Reis, 2013). My results don't indicate participants are as skeptical and untrusting as these studies.

The next hypothesis we look at is **H3**: Consumers will have varying purchase intents based on the sin of the greenwashed label. However, there was no evidence for this in my results.

I don't know if the purchase intent would vary with a product with no label because I asked about the label's likelihood to influence purchase intent, but that may be something to be studied in the future. The fact that there was no significant relationship between sin condition and purchase intent is a particularly important finding because, to the best of my knowledge, no other studies have examined this question looking at the sins individually. Therefore, this hypothesis wasn't directly derived from other research. However, after looking at the studies, both Newell and Stokes concluded that if consumers were able to identify the deceptive ad, they had negative attitudes toward the brand, the ad itself, and toward green advertising (Newell et al., 1998; Stokes, 2007). Newell found from this that consumers who identified the ad as greenwashed had a lower intent to purchase and found the advertiser less credible (Newell et al., 1998). Krafft et. al., however, examined purchase intention and found that greenwashing increased purchase intent among consumers (2014). I had initially expected that if consumers were more suspicious of one label in particular and found that one less credible, they might also have a lower purchase intent for that product. Perceptions matter for purchasing, so I assumed the link would likely be here. However, this wasn't the case for my results. I also didn't look at a comparison of consumers having a higher purchase intent for products with greenwashed labels than without, so that could be something to study in the future.

Finally, examining **H4**: Consumers will believe greenwashing is problematic, but will not be able to identify a greenwashed label, we see the first part of this holds true in all cases. No matter the sin, the mean for perception that greenwashing was problematic was above 3.25 in all cases. This leads me to believe participants were concerned and thought greenwashing was problematic. Those with low levels of environmentalism thought greenwashing was less problematic than those with high levels, and older individuals thought it was less problematic

than younger individuals. But all individuals overall, thought it was problematic. The second part of this hypothesis does not hold true in all cases. Having a sin present in this case was crucial: once I explained what greenwashing was, those who were given a label were able to identify it as greenwashing and those who didn't receive a label didn't believe the product was a case of greenwashing. The explanation of greenwashing meant participants became more suspicious of the labels and were able to identify the label as greenwashing. This evidence is not consistent with the literature I found, however I wasn't examining the ability to identify a greenwashed ad from one that wasn't; I was examining their ability to identify it at all. The literature revealed that consumers couldn't identify greenwashed ads or designs as deceptive (Krafft, 2014; Newell et al., 1998). The first piece of this hypothesis is not studied. However, the conclusion that consumers are convinced greenwashing is a problem is quite useful for future. In some ways, doubt can be a positive thing. Green skepticism can cause consumers to seek out more information about the product through asking friends, reading certification credentials, looking at websites, and so on. In addition, if consumers are more demanding, it will lead to better prevention efforts, harsher standards, and more widely recognized labels.

The most important conclusions drawn from the results of my study are primarily that (1) people believed the products were more sustainable, were more trustworthy, and had a higher perception of them overall if they had a greenwashed label than if they had no label at all. (2) Consumers were trusting of greenwashed labels and weren't necessarily more skeptical of a label that was completely false than one that was just vague. (3) Consumers were concerned about greenwashing being problematic and they were able to identify it, once they were aware of what the phenomenon was. (4) I also can conclude that strong environmentalists are more perceptive of greenwashing. They were more able to identify it, believe its problematic, and believe its

common. (5) It was also a trend that the least used sin, the Sin of Worshipping False Labels, was the most powerful. This was on both ends of the spectrum: people thought this label made the product more sustainable but were also less trusting of it than any other label. The Sin of Irrelevance and the Sin of Vagueness also exemplified similar results across many variables including product perception, perception of product sustainability, and label trustworthiness. This is shown in Figure 8 Part A, C, and E. They did not, however, exemplify the same pattern as far as the trustworthiness of the entire product. This shows the label itself matters.

This brings to light fascinating potential implications and needs for further research. It is worrisome people were trusting until they were aware of the phenomenon. In a future study it would be useful to show participants a greenwashed label and a label that is not greenwashed to see if they can tell the difference between the two, which one they trust more, which one they are more likely to purchase and so on.

This study is one of many qualitative studies done to try to further understand greenwashing and its effects on consumers. My findings confirm greenwashing is still a problem in that it works: it often convinces consumers they are getting a more sustainable product than they actually are. However, consumers become more skeptical once they are aware of the phenomenon. Thus, we need prevention efforts to help us tackle this problem.

### **Prevention Efforts**

In order to try to stop companies from partaking in greenwashing, several efforts have been made. First off, there are International Standards aimed at creating guidelines so companies can advertise truthful aspects of a product in a label or declaration (ISO, 2012). ISO has thousands of standards, but the ISO 14020 series is a specific set of standards that “provides businesses with a globally recognized and credible set of international benchmarks against which

they can prepare their environmental labeling” (ISO, 2012). This way companies and businesses can advertise the greenness of their products without being inaccurate or running the risk of confusing consumers. ISO is designed to deal with three types of environmental claims: Type I environmental labeling, Type II self-declared environmental claims, and Type III environmental declarations (ISO, 2012). ISO 14021 is one of the standards in the 14020 series and essentially makes it so that environmental claims are not required, but if one is made, how it can be done in a way that is meaningful and useful to the consumer (ISO, 2012). They recommend that the claims should be verified and information must be available to back up the claims, especially for consumers who want it. This standard required that for all self-declared environmental claims, the claim is accurate and not misleading, verified, and unlikely to result in misinterpretation (ISO, 2012). ISO 14024 is another standard in the series that deals with eco-labeling. “Eco-labels” are defined as multi-criteria, life-cycles seals of approval. The standard has been adopted by the Global Ecolabelling Network (GEN) which is the international federation for ecolabeling. This non-profit, third-party sets criterion, certifies, and provides a label for products or services that lower environmental impacts compared with other similar products and services (GEN). The ISO 14024 applies the principles that environmentally labeling programs should be voluntary, you must comply with environmental legislation, and the entire life-cycle of the product must be taken into account when assessing environmental impact (ISO, 2012). If companies and businesses meet the ISO 14024 criteria then they will receive certification and are authorized to use the label (ISO, 2012). ISO 14025 is the last international standard in the 14020 series and establishes the procedure in which environmental declarations can be made. This is hopefully to aid consumers in making informed decisions when it comes to green products. It is recommended businesses use and adhere to each of these standards because they have global

recognition and are recognized by diverse groups (ISO, 2012). It is refreshing to see such efforts being made to encourage those who are taking steps to reduce their environmental impact to adhere to standards that will make them more credible and believable in the eyes of many consumers. However, many businesses and companies still do not follow these set standards and get away with selling misleading products to consumers.

One of the most famous cases of false green advertisement was the case of Mobil Chemical Company. They advertised their Hefty bags as environmentally friendly because they were “biodegradable;” However, this was only the case if they were left exposed to wind, rain and sun, but not at all when covered in a landfill (Newell et al., 1998). Even worse, Mobil left this information out. This was what led the FTC, in 1992, to create the guidelines that any environmental advertising claims "must be substantiated and be clear as to whether any assumed environmental advantage applies to the product" (Carlson et al., 1993). The Federal Trade Commission (FTC) is the agency designated to combat deceptive green advertising and enforce violations (Fliegelman, 2010). This was developed further into the Federal Trade Commission Act (FTCA) enacted by Congress to protect consumers. This essentially gave the FTC the authority to prevent unfair or deceptive acts that affect commerce (Fliegelman, 2010). However, they didn't give a definition to unfair or deceptive so it has been very difficult to actually implement. Therefore, enforcement of guidelines, like these ones created by the FTC, is not easy and is limited (Delmas & Burbano, 2011).

Another prevention effort is the existence of eco-labeling. Eco-labeling is essentially a voluntary method of certification for environmental performance that is recognized worldwide. It is a system to help identify the products that are environmentally preferable over other alternatives in their specific category (GEN, 2017). These are not symbols or claims, but instead



are credible labels awarded by impartial third parties “for specific products or services that have been independently determined to meet transparent environmental leadership criteria, based on life-cycle considerations” (GEN, 2017). Within ecolabels there are Type I, Type II, and Type III eco-labels, as discussed previously. With having worldwide recognition, it attempts to encourage companies to go through this channel to advertise their environmental efforts and make consumers aware of environmental issues. One of the main challenges for eco-labeling is building consumer recognition. It takes time for consumers to start recognizing these labels and trust that they are legitimate (GEN, 2004). Eco-labeling is helping prevent greenwashing by generating recognizable labels for consumers. The expansion of eco-labels is incredibly important because the consumers that actually buy green products are the ones that put value in the government and their ability to provide accurate information (Darnall & Ponting, 2010). If those consumers don't trust that the government can provide accurate information, green purchasing as a whole will decline. In other words, consumers consumption of green products is related to their trust of where the environmental information comes from (Darnall & Ponting, 2010). TerraChoice believes eco-labeling is an important part of the solution to cutting down on greenwashing as well (2010).

It's a positive thing that there are more “green” home and family products entering the world. The demand for green products also indicates consumers really want green alternatives and are willing to pay for them. TerraChoice also found evidence from their studies that the issue of greenwashing is going down. The number of sin-free products has doubled in the last two years, from 1% in 2007 to about 2% in 2009, and to almost 4.5% in 2010 (TerraChoice, 2010). However, even with prevention efforts, like eco-labeling and the ISO 14020 series, 95% of “greener” products committed one or more of the sins (TerraChoice, 2010). Products that were

certified by the ISO 14024 program had more than 30% that were sin-free, but this also indicates that this doesn't eliminate greenwashing entirely (TerraChoice, 2010). Therefore, it is essential to keep understanding consumer's perceptions of greenwashing to implement prevention efforts that will continue to be successful.

### ***Conclusions and Recommendations***

With my research, I can take away several unique conclusions. First off, in all cases having label that was greenwashed, worked and was successful in convincing participants that the product was more sustainable than if there was no label at all. Second, participants were not skeptical and untrusting of greenwashed labels. The Sin of Worshipping False Labels was found to be slightly less trustworthy, but none of the labels overall were found to be untrustworthy. I believe this would be useful for future research to look at the varying levels of trustworthiness between products with a label that is greenwashed and one that isn't. Third, consumers did not have varying purchase intents based on the sin. However, it might be interesting to look at varying purchase intents for products with a greenwashed label and without. Fourth, consumers were concerned about greenwashing being problematic and they are able to identify it, once they are aware of what the phenomenon is. As mentioned earlier, it would be useful to look at consumers ability to identify greenwashing between a greenwashed label and one that is not. In addition, I also can conclude that strong environmentalists are more perceptive of greenwashing than low or moderate environmentalists. They were more able to identify it, believe its problematic, add believe its common. However, overall, all levels of environmentalism were concerned with greenwashing being problematic and common. Finally, I can conclude that older individuals are more trusting of labels and less concerned with greenwashing as a whole.

Each of these findings either adds something to the existing literature or confirmed what other studies have found. What is clear though is that greenwashing works. People believe greenwashed products are trustworthy and sustainable. It also works differently on various demographic groups, which could be studied further. However, once their attention is brought to greenwashing they are much more suspicious and able to identify it. Furthermore, consumers are concerned that greenwashing is common and is a problem, which means there is reason to mitigate this phenomenon.

My research is based off of conditions I created from TerraChoice's findings of various sins, so I could look at consumer perceptions of greenwashing. However, these conditions weren't entirely realistic, so this is a limitation of my research. Another potential limitation was the lack of older individuals and primarily female individuals in my group of respondents. In future studies it would be useful to have a more evenly distributed sample as far as age and gender especially, but also to incorporate conditions that include products that aren't greenwashed as well as ones that are, to examine consumer perceptions between the two.

Additional research will be necessary to further understand how consumers perceive greenwashing, so policy action can be improved. Something interesting Parguel et. al. suggests is the idea for sustainability ratings to be available for each company. In other words, governments would analyze the environmental impact of each company and make that information available to the public (Parguel et al., 2011) This supports findings from Leonidou and Skarmeas that green skepticism generates a greater interest from consumers to obtain more information on green products (Leonidou & Skarmeas, 2017). Parguel's suggested solution would address this desire for consumers and would be accurate for every company. Another suggestion is to increase consumer awareness with a nationwide eco-labeling program or a carbon labeling

program to provide information to consumers so they can make the right choices and encourage manufacturers to limit their negative impacts on the environment (Fliegelman, 2010). I do believe that my results support increasing awareness. Once participants were aware of the phenomenon, they were more skeptical and concerned.

Greenwashing is a successful phenomenon, but the best way to help consumers and companies that are trying to be more environmentally friendly is by increasing transparency and education for consumers. The battle is not over, but it may be possible to put an end to greenwashing by tackling one lie and one exaggeration at a time.

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## *Appendix*

### Survey

#### Consumer Perception of Greenwashing Survey

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##### Start of Block: Introduction

##### Informed Consent Form

**Introduction** This study will ask you questions about your beliefs and lifestyle choices in terms of the environment. You will also be shown a print message of a generic product with a label, similar to what might appear in a store. You will then be asked to evaluate this message.

**Procedures** You will be asked several basic questions about yourself (such as your age, gender, etc.). You will then be shown a message and will be asked to evaluate this message. Finally, we will ask you a series of questions about your attitudes and beliefs about companies and products environmental claims. The entire study will take about 5 - 10 minutes to complete. You will be asked to view and evaluate only one message; however, this message will be randomly selected from a set of messages that the researchers have developed. This will allow the researchers to compare how survey respondents react to each message individually, and whether the content of a message influences these reactions.

**Risks and Benefits** There are no direct risks to you from participating in this study, nor are there any direct benefits. However, this study will benefit society by providing insights into how we can communicate more effectively which products are sustainable.

**Confidentiality** All data obtained from participants will be kept confidential. We will not ask you any questions that will allow us to identify you personally. All information that we collect will only be reported in an aggregate format (by reporting only combined results and never reporting individual ones).

**Participation** Participation in this research study is completely voluntary. You have the right to withdraw at any time or refuse to participate entirely. If you desire to withdraw, please close your internet browser.

**Questions about the Research** If you have questions regarding this study, you may contact the principal investigator (Rachel Halverson) at 970-401-4049 or raha9628@colorado.edu . If you have questions about your rights as a research participant, you may contact the University of Colorado's Institutional Review Board at (303) 735-3702.

Click below to acknowledge that you have read and understood the consent form and desire of your own free will to participate in this study. If you do not agree, please close your web browser.

I agree (4)

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Page Break



What is your gender?

- Male (1)
  - Female (2)
  - Other (3) \_\_\_\_\_
- 

What is your age?

\_\_\_\_\_

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What is the highest level of education you have achieved?

- Completed some high school (1)
  - High school graduate (2)
  - Some college (3)
  - Associate's degree (4)
  - Bachelor's degree (5)
  - Graduate or professional degree (6)
- 

Are you currently a student?

- Yes (1)
  - No (2)
-

How would you best describe your political affiliation?

- Democrat (1)
- Republican (2)
- Independent (3)
- Independent, lean Republican (4)
- Independent, lean Democrat (5)
- None (6)
- Other (7) \_\_\_\_\_

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Page Break

---

What was your total household income before taxes during the past 12 months?

- None (1)
  - Less than \$25,000 (2)
  - \$25,000 to \$34,999 (3)
  - \$35,000 to \$49,999 (4)
  - \$50,000 to \$74,999 (5)
  - \$75,000 to \$99,999 (6)
  - \$100,000 to \$149,999 (7)
  - \$150,000 to \$199,999 (8)
  - \$200,000 or more (9)
- 

Which state do you live in?

---

Which of the following is an emotion?

- Apple (1)
- Pencil (2)
- Happiness (3)

*Skip To: End of Survey If Which of the following is an emotion? = Apple*

*Skip To: End of Survey If Which of the following is an emotion? = Pencil*

**End of Block: Introduction**

---

**Start of Block: Social Identity**

These items describe different aspects of how you might think of your identity and what is important to you in the context of the environment. Please read each item carefully and tell us to what extent you identify with the questions.

---

To what extent do you identify as an environmentalist?

- Not at all (1)
  - Slightly (2)
  - Somewhat (3)
  - Mostly (4)
  - Completely (5)
- 

How important is it for you to strive to live a sustainable lifestyle?

- Not at all important (1)
  - Slightly important (2)
  - Somewhat important (3)
  - Very important (4)
- 

When purchasing products, how often do you look for green alternatives?

- Never (1)
- Rarely ever (2)
- Some of the time (3)
- Often (4)
- Almost always (5)

---

What is  $3 + 3$ ?

- 5 (1)
- 6 (2)
- 9 (3)
- 10 (4)

*Skip To: End of Survey If What is  $3 + 3 = 5$*

*Skip To: End of Survey If What is  $3 + 3 = 9$*

*Skip To: End of Survey If What is  $3 + 3 = 10$*

**End of Block: Social Identity**

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**Start of Block: Sin of Worshipping False Label**

Below is an image, as well as several statements. Answer each question to the best of your abilities.

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Please rate this product on various features. To what extent do you consider this product:

	Not at all (1)	A little (2)	Somewhat (3)	Mostly (4)	Very (5)
Attractive (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sustainable (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Informative (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Trustworthy (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
High Quality (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Appealing (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

---

To the best of your knowledge, how environmentally friendly would you consider this product?

- Not at all (1)
  - Slightly (2)
  - Somewhat (3)
  - Very (4)
  - Extremely (5)
-

To what extent do you trust the "Certified Green" label provided on the product?

- Not at all (1)
  - Minimally (2)
  - Somewhat (3)
  - Reasonably (4)
  - A lot (5)
- 

Would seeing this label make a difference in your decision to purchase it?

- Much less likely (1)
- Somewhat less likely (2)
- Slightly less likely (3)
- No difference (4)
- Slightly more likely (5)
- Somewhat more likely (6)
- Much more likely (7)

**End of Block: Sin of Worshipping False Label**

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**Start of Block: Label Open Ended**

Thinking about your impressions of the greenness of this product, what motivated you to respond in the manner you did?

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Was the label helpful in making a judgement about the environmental friendliness of the product?

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**End of Block: Label Open Ended**

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**Start of Block: Sin of Vagueness**

Below is an image, as well as several statements. Answer each question to the best of your ability.

---

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Please rate this product on various features. To what extent do you consider this product:

	Not at all (1)	A little (2)	Somewhat (3)	Mostly (4)	Very (5)
Attractive (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sustainable (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Informative (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Trustworthy (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
High Quality (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Appealing (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

---

To the best of your knowledge, how environmentally friendly would you consider this product?

- Not at all (1)
  - Slightly (2)
  - Somewhat (3)
  - Very (4)
  - Extremely (5)
-

To what extent do you trust the "recycling" label provided on the product?

- Not at all (1)
  - Minimally (2)
  - Somewhat (3)
  - Reasonably (4)
  - A lot (5)
- 

Would seeing this label make a difference in your decision to purchase it?

- Much less likely (1)
- Somewhat less likely (2)
- Slightly less likely (3)
- No difference (4)
- Slightly more likely (5)
- Somewhat more likely (6)
- Much more likely (7)

**End of Block: Sin of Vagueness**

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**Start of Block: Sin of Irrelevance**

Below is an image, as well as several statements. Answer each question to the best of your ability.

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---

Please rate this product on various features. To what extent do you consider this product:

	Not at all (1)	A little (2)	Somewhat (3)	Mostly (4)	Very (5)
Attractive (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sustainable (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Informative (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Trustworthy (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
High Quality (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Appealing (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

---

To the best of your knowledge, how environmentally friendly would you consider this product?

- Not at all (1)
  - Slightly (2)
  - Somewhat (3)
  - Very (4)
  - Extremely (5)
-

To what extent do you trust the "No CFCs" label provided on the product?

- Not at all (1)
  - Minimally (2)
  - Somewhat (3)
  - Reasonably (4)
  - A lot (5)
- 

Would seeing this label make a difference in your decision to purchase it?

- Much less likely (1)
- Somewhat less likely (2)
- Slightly less likely (3)
- No difference (4)
- Slightly more likely (5)
- Somewhat more likely (6)
- Much more likely (7)

**End of Block: Sin of Irrelevance**

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**Start of Block: No sin**

Below is an image, as well as several statements. Do your best to answer what each means to you.

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Please rate this product on various features. To what extent do you consider this product:

	Not at all (1)	A little (2)	Somewhat (3)	Mostly (4)	Very (5)
Attractive (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sustainable (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Informative (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Trustworthy (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
High Quality (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Appealing (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

---

To the best of your knowledge, how environmentally friendly would you consider this product?

- Not at all (1)
- Slightly (2)
- Somewhat (3)
- Very (4)
- Extremely (5)

**End of Block: No sin**

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**Start of Block: No Label Open Ended**

Thinking about your impressions of the greenness of this product, what motivated you to respond in the manner you did?

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Was it less helpful there was no environmental label to help you make a judgement about the environmental friendliness of the product?

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End of Block: No Label Open Ended

Start of Block: Greenwashing

Green advertising is becoming more abundant as companies try to show that they care for the environment and in turn, attract sustainably driven consumers. However, this has also led to an increase in greenwashing in which companies are using strategies to attract these same consumers, but without making significant, or sometimes any, changes to their products. This can range from advertising incredibly broad claims like “all-natural,” to obtaining faulty “green certifications.” This study is designed to test consumer awareness of greenwashing.

In your opinion, do you think this packaging was a case of greenwashing?

- Not at all (1)
- Slightly (2)
- Somewhat (3)
- Very (4)
- Extremely (5)

Do you think greenwashing is a problem?

- Not at all (1)
  - Slightly (2)
  - Somewhat (3)
  - Very (4)
  - Extremely (5)
- 

In your opinion, how common do you think greenwashing is?

- Not at all (1)
- Slightly (2)
- Somewhat (3)
- Very (4)
- Extremely (5)

**End of Block: Greenwashing**

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**Start of Block: Block 9**

The study you have just completed was designed to help us understand consumer's perceptions of green washing and your overall awareness.

In this study, you were shown one randomly chosen message from a set of 4 possible messages. Some participants saw the generic product advertising a lack of CFC's. Others saw the same product, but with a label that advertised recycled materials. Other participants saw the product with a generic green label. The questions that you answered after you saw the message will allow me to understand the extent to which consumers are aware and understand several different types of green washing. The results of this study

will be made available to the public Companies are doing a lot to promote sustainability of their brands, but at same time a lot of misinformation is floating around.

We thank you for your participation in this research. If you have any questions, please feel free to contact the researcher at raha9628@colorado.edu . If you have questions about your rights as a research participant, you may contact the University of Colorado's Institutional Review Board at (303) 735-3702.

**End of Block: Block 9**

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