



AN ABSTRACT OF THE THESIS OF

Natalia Linda Garza for the degree of Honors Baccalaureate of Arts in Business Information Systems presented on November 19, 2010. Title: Effect of Ecolabels in Context on Perceived Sustainability

Abstract approved:

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Chris Knowles

This study provides an overview of topics related to ecolabels and examines consumer perceptions of sustainability given different ecolabels. An internet based survey was used, and different ecolabels were found to have variant impacts on consumer perceptions of sustainability using descriptive statistics. More research concerning the perceptions of ecolabels on sustainability is warranted as their use (and misuse) increases in response to growing environmental concerns by consumers.

Key Words:

Ecolabels, sustainability, green products, green marketing

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Effect of Ecolabels in Context on Perceived Sustainability

by

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A PROJECT

submitted to

Oregon State University

University Honors College

in partial fulfillment of  
the requirements for the  
degree of

Honors Baccalaureate of Arts in Business Information Systems (Honors Scholar)

Presented May 27, 2010  
Commencement June 2011

Honors Baccalaureate of Arts in Business Information Systems project of Natalia Linda Garza presented on May 27, 2010.

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## **ACKNOWLEDGEMENTS**

My appreciation goes to my mentor, Prof. Chris Knowles, for working with me though the thesis process under strict time constraints. I was also lucky to have Leslie Burns and Laurie Bridges on my committee, both of whom were a pleasure to work with. Finally, I like to thank my friends and family for their support in my endeavors.

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## **INTRODUCTION**

The term “ecolabels” became popular in the mid 1980’s and refers to the display of environmental information (Grumper, 2000). More specifically, an ecolabel can be defined as a symbol that seeks to inform consumers that the product it appears on is in some way less harmful to the environment than alternatives.

According to the 2010 Global Ecolabel Monitor, the number of ecolabeled products has grown in many product segments since the 1980’s. For example, ecolabeling on organic food products has grown 20-30% per year since the late 1990s and early 2000s (Big Room Inc. & World Resources Institute [WRI], 2010). Today the Ecolabel Index, the largest global directory of ecolabels, tracks 377 ecolabels in 211 countries, and 25 industry sectors. (Big Room Inc., 2011)

While research into the effects of ecolabeling, is limited, most examine consumers’ willingness to pay extra for ecolabeling and the resulting influence on their purchasing decisions. Other studies have focused on consumer understanding of ecolabels.

The objective of this study is to answer the following questions: Do ecolabels, in the context of other product packaging, imagery and labeling, affect consumer

perceptions of the product's sustainability? If so, do different ecolabels have a significantly variant impact on said perceptions? The significance of this research is that it will help identify the value of third party ecolabels on packaging as part of green product marketing.

## **LITERATURE REVIEW**

The following sections will discuss the meaning of sustainability, green marketing, and an ecolabel's role in signaling sustainability. In the context of this study, ecolabels refer to third party seals/labels that are displayed on products, indicating that product is in some way sustainable.

### **Sustainability**

A widely accepted definition for sustainability is “meeting the needs of the present without compromising the ability of future generations to meet their own needs” (World Commission on Environment and Development [WCED], 1987). This definition states that the three aspects of sustainability are environmental, economic, and social and must to work together and are often referred to as the three pillars of sustainability.

Research shows many American consumers are likely to choose one brand over another if they believe the brand will help the environment (Carlson, Grove, & Kangun, 1993) and according to the 2010 Global Ecolabel Monitor, demand for products with ecolabels is growing (Big Room Inc. & WRI, 2010). Consequently, many companies seek to profit from this new environmentally-conscious market through environmental marketing techniques (Carlson et al., 1993) such as the use of ecolabels on product packaging.

## **Green Marketing**

According to the American Marketing Association (AMA), environmental marketing or "green marketing" is the marketing of products that are presumed to be environmentally safe (American Marketing Association Dictionary, 2011). However, increased green marketing has regulators concerned that many environmentally related marketing claims are being used to mislead consumers, (Polonsky, Bailey, Baker, Basche, Jepson, & Neath, 1988) a practice sometimes referred to as "green washing".

A subtle example of green washing would be a hotel bathroom displaying a sign that reads "Save the planet: Re-use towels", giving the impression that the hotel is concerned about conserving water, when in reality, they are merely trying to reduce their laundry expenses.

## **Package Design**

Package design is another way marketers can indicate a product is somehow more sustainable than others. A single product package usually has several design elements that together give some impression of the nature of that product. Seven categories of packaging elements relevant to environmental marketing were identified by Polonsky et al. (1998) and are explained in Table 1. However, Polonsky found that the majority of environmental information on packaging was ambiguous at best.

The researchers of this study chose to use a liquid laundry detergent bottle to examine ecolabels because of the prevalence of green marketing in the laundry and household cleaning products industry (Polonsky et al., 1998). Laundry detergents were also considered to be used by nearly all households. The bottle of an established brand of

detergent called CitaSuds was used because CitraSuds detergent is not available in typical grocery stores. This reduces the risk of participant's perceptions of the product's sustainability being affected by brand association. Also, it is marketed as a green product and therefore, it is more realistic for ecolabels to be displayed on its packaging.

Table 1: Seven Elements of Package Design

Category	Definition
Images	Any term/symbol eg: save the rainforest, that the firm purposely places on the packaging in order to convey a certain image about their environment concern. It should include an explanation of how they are contributing to the environment or benefiting the environment, such as "10 cents from every bottle sold goes towards saving the worlds rainforest . . ."
Licensing agreement	1) A private aid designed to give the consumer some dependable third party assurance as a verification of the environmental claims made on the packaging. It characterises them as being; "tested", "guaranteed", "certified", "approved" and or "recommended by." 2) An agreement with a third party e.g. Greenpeace, which is used in order to portray information in regards to their environmental policies and/or contributions to that cause. To avoid misleading consumers, the use of official agreements should include: – The nature of the scheme, such as the standards to be met in order to use it on the packaging; – indication of how much the organisation contributes to the cause; – or a contact number for more information.
Scientific/ environmental attribute	Any environmental scientific term e.g. CFC free, biodegradable, recycled. It is a term that's meaning the general consumer might not know or completely understand. In order order to avoid being misleading, the use of the term <i>should</i> also refer to which specific part of the product, packaging or production process the term is used for. e.g. X% of this packaging is recycled.
General environmental claims	A general environmental claim is an attempt to portray a general environmental benefit that the product exhibits. It is not a specific environmental attribute, such as "biodegradable", but is a general statement/expression which relates to the product or environment as a whole. For example "designed to reduce environmental degradation", "eco-safe", or "breaks down faster". Such statements should be avoided unless they are entirely explained on the packaging.
Product name	It is the name of the product. The product name is predominately on the packeting, e.g. Mortein.
Logos	A logo is a visual representation of the product name.
Pictures	Pictures are classified as any environmental graphical representations other than logos or images appearing on the package eg trees, koalas, rainforests, etc. Such pictures may be capable of implying environmental benefits. Such pictures may be justified by explaining why they are used. For example, if a picture of a koala is used because the company supports koala research, then the words "We support Koala research by . . ." should be used as well.

Source: Polonsky et al., 1998


Seven elements on the label of the bottle chosen for this study include the 2x concentration label, brand name, description of product as a “natural laundry detergent”, stylized orange image, a list of attributes, the high efficiency symbol and the fragrance, Valencia Orange.

## Ecolabels

An ecolabel can be defined as a symbol that seeks to inform consumers that the product it appears on is in some way less harmful to the environment than alternatives. The most common approach to ecolabeling is to display a “seal-of-approval” on a product based on a third-party evaluation of multiple attributes (Tang, Fryxell, & Chow, 2001). Examples of this kind of ecolabel can be found in Table 2.

These three ecolabels were selected for the study because they were found to be the most common ecolabels found on household cleaning products at three major grocery stores in the Corvallis area.

Table 2: Overview of Ecolabels

<b>Cradle to Cradle<sup>SM</sup></b>	
	<p>The Cradle to Cradle (C2C) certification program was developed in 2005 by McDonough Braungart Design Chemistry (MBDC), a for-profit sustainability consulting and product certification firm founded in 1995 by architect William McDonough and chemist Dr. Michael Braungart. MBDC consults clients on leaving a 'positive footprint' on the planet instead of reducing a negative footprint. (McDonough Braungart Design Chemistry, LLC [MBDC], 2010)</p>
<p>C2C is a multi-attribute certification program that assesses a product for safety to human and environmental health, design for future life cycles, and responsible manufacturing processes. A certified product will be assessed in five categories: Material Health, Material Reutilization, Energy Use, Water Stewardship, and Social Responsibility. Other certification programs are single-attribute and only measure one trait, such as carbon</p>	

emissions. (MBDC, 2010)

C2C is also a multi-level program that awards different levels of success along a continuum. MBDC wants to engage companies at varying levels of environmental achievement and work with them to continue to improve their products and processes. Furthermore, at each level of certification products must meet the same minimum requirements in all five categories. All products and materials in all categories and industries must meet the same requirements so that consumers can more easily compare the eco-effectiveness of different products. (MBDC, 2010)

The C2C certification is registered in the United States, European Union, and Japan and is pending in several other countries. Products and materials in all categories are eligible for C2C certification, and the MBDC allows a period for public comment whenever a version upgrade of the C2C criteria is proposed. The cost of certification ranges from \$5,500 - \$75,000+ and lasts one year, but can be renewed. (MBDC, 2010)

### **Design for the Environment**



EPA], 2010).

The Design for the Environment (DfE) product labeling program was established in 1997 to advance the U.S. Environmental Protection Agency's (EPA) mission to protect human health and the environment. This government program uses EPA's chemical expertise and resources to carefully evaluate product ingredients and to label only those that have met the program's standards. To date, the EPA has allowed use of their DfE label on over 2000 products. (United States Environmental Protection Agency [U.S.

DfE starts with information that scientists already know about each ingredient such as how it works in a detergent, and how it affects living things. When that information doesn't tell the full story, EPA looks at an ingredient's chemical structure to understand how it could impact the environment and people. By doing so, the EPA can uncover masked chemicals of concern and spot negative synergies between product components. (U.S. EPA, 2010)

Next, the DfE compares an ingredient's characteristics to other chemicals in the same class. Before DfE allows their label on a product, DfE makes sure that only the safest ingredients from each class are used. Finally, the DfE helps product manufacturers by educating them and guiding them toward the development of safer products. (U.S. EPA, 2010). Though the EPA helps to protect consumers and the environment from harmful chemicals, it does not address the sustainability of products in the DfE program.

### **Leaping Bunny**



® Established in 1998, the Leaping Bunny Program is managed by the Coalition for Consumer Information on Cosmetics' (CCIC), a non-profit organization. The Leaping Bunny label can be seen on packaging, advertising, and point-of-sale purchases for cosmetics and household products. (Coalition for Consumer Information on Cosmetics [CCIC], 2009).

Oftentimes, products claim to be “cruelty-free” or “not tested on animals”, but their claims may only refer to the finished product. Similarly, some companies may state, “We do not test on animals,” when in fact they merely contract other companies to do the testing. Companies certified through Leaping Bunny Program, however, make a voluntary pledge to eliminate animal testing from all stages of product development. The companies’ ingredient suppliers make the same pledge and the result is a product guaranteed to be 100 percent free of new animal testing. While many ingredients have been tested on animals in the past, the Leaping Bunny program is designed to prevent future animal testing and eventually drive animal testing out of the industry completely. (CCIC, 2009)

All Leaping Bunny companies must be open to independent audits, and commitments are renewed on an annual basis. A one-time licensing fee, based on the company's gross annual sales, is required for use of the trademarked label as well. The Leaping Bunny label is the only internationally recognized label of its kind and is used in the United States, Canada, the United Kingdom, and throughout much of the European Union. (CCIC, 2009) Though the CCIC helps to protect animals from being subjected to product testing, it does not address the sustainability of products in the Leaping Bunny program.

Given the body of research on ecolabel design, few studies have evaluated the labeling scheme itself, the label’s popularity, or the reasons why consumers might notice an ecolabel (Tang et al., 2001). However, one study by Banerjee and Solomon (2003) did examined five energy labeling programs in order to identify the factors that make labeling programs successful. This study found that seal-of-approval labels were better understood by consumers than others because of their simplistic design, as few consumers were willing and/or able to use more technical information. Another factor found to impact consumer impressions of energy labels was government support, which increased a label’s credibility and recognition.



Banerjee's and Solomon's findings are congruent to another study performed by Teisl, Peavey, Newman, Buono, and Hermann (2002) which explores consumer attitudes and beliefs about various environmental labels used for wood products and how this influences their purchasing decisions. In addition, Teisl et al. found that participants favored labels that contained either a numerical rating or graphical rating, as long as the label also provided a reference for comparison. The study also examined the impact of price on consumer preference of ecolabeled wood products. Findings showed that although price tended to weigh heavily in the purchase decision for all hypothetical products, ecolabels appeared to be most influential when the product was a heavily used and relatively inexpensive item.

## **NEP Scale**

The New Environmental Paradigm (NEP) Scale, published in 1978 has been a widely used measure of pro-environmental orientation. (Dunlap, Van Liere, Mertig, & Jones, 2000). This study's survey includes the revised NEP Scale, referred to as the New Ecological Paradigm (NEP) which was published in 2000 and consists of 15 questions. The NEP is said to represent "primitive beliefs" of individuals regarding the relationship between humanity and the nature of the earth (Dunlap et al., 2000). According to social psychology theory, stronger NEP beliefs should lead to more pro-environmental attitudes and behaviors (Dunlap et al., 2000).

One troublesome aspect of many studies on green consumerism is that survey respondents sometimes profess to be more environmentally concerned than they really are (Tang et al., 2001). Scales such as the NEP allow researchers to discover a

respondent's actual environmental concern as well as account for variance due to the respondent's environmental predispositions.

## **METHODOLOGY**

Given the multitude of messages being sent to consumers via package design, an online survey was designed to learn if the presence of different ecolabels on the same package would make a significant difference to the products overall perception of sustainability. The package used in the study was a CitraSuds liquid laundry detergent bottle, and the three ecolabels tested on this bottle were the Cradle to Cradle, Designed for the Environment, and Leaping Bunny labels.

### **Data Collection**

The online survey link was emailed to the wood sciences and engineering graduate email list at Oregon State University (OSU). These 31 students were chosen as participants because they likely have a longer history of making their own purchasing decisions when compared to undergraduate students. Also, these graduate students are more likely to have been exposed to the ecolabels used in this study, and are more likely to be familiar with the concept of sustainability. Participation was voluntary and all participants were required to select the “I agree” option on the consent page to continue the survey.

### **Questionnaire Design**

The survey was designed using Survey Monkey and can be found in the appendix. First, the NEP questionnaire was implemented on the first page of the survey. This

portion of the survey was intended to be used to account for variability due to a participant's degree of environmental concern.

Next, in order to test which ecolabels best signaled a product was sustainable, participants were asked to rank four laundry detergent bottles with different ecolabel treatments. Three of the bottles each had a distinct ecolabel on them, and one bottle did not. All the bottles were otherwise identical.

Lastly, participants were asked if they were familiar with the brand detergent and/or any of the ecolabels used in the survey in addition to some basic demographic information. This information was intended to be correlated with the results of the ecolabel preference section of the survey to find any relationships between the two data sets.

## DATA ANALYSIS

Due to the time constraints of this study and low survey participation, descriptive statistics was used to analyze the findings of the survey and the NEP portion of the survey was not taken into consideration. Of the 31 students contacted, 15 participated in the survey.

Survey results showed that the bottle with the C2C label was slightly higher ranked for sustainability than bottle with the DfE label, and the bottle with no label was ranked the lowest (see Table 3). Participants were also slightly more familiar with DfE label than the C2C label; however, most respondents were not familiar with the labels used in the study, and only one participant was familiar with the Leaping Bunny label (see table 4).

Table 3: Average Rankings of Detergents

<b>Question:</b> Rank each laundry detergent below from ONE to FOUR, FOUR being the LEAST sustainable detergent, and ONE being the MOST sustainable detergent.						
<b>Answer Options</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>Rating Average</b>	<b>Response Count</b>
Cradle to Cradle (C2C)	6	7	1	1	1.80	15
Designed for the Environment (DfE)	6	7	2	0	1.73	15
Leaping Bunny	2	1	8	4	2.93	15
No label	1	0	4	10	3.53	15

\*C2C=Bottle A, DfE=Bottle B, Leaping Bunny =Bottle C, No label=Bottle D

Even though the CitraSuds detergent bottle was chosen because the CitraSuds brand was likely to unfamiliarity to most consumers, two participants were actually

familiar with the brand (see table 5). Another curiosity was that although the survey was sent out exclusively to OSU student, three participants identified themselves as not being OSU students. A summary of demographic information from all participants can be viewed in Table 6.

Table 4: Familiarity with Labels

<b>Question:</b> Are you familiar with the following logos?			
<b>Answer Options</b>	<b>Yes</b>	<b>No</b>	<b>Response Count</b>
Cradle to Cradle (C2C)	5	10	15
Design for the Environment (DfE)	6	9	15
Leaping Bunny	1	14	15

\*C2C=Logo A, DfE=Logo B, Leaping Bunny= Logo C

\*The term “logo” was used in place of “label” in the survey.

Table 5: Familiarity with Brand

<b>Question:</b> Are you familiar with the brand of laundry detergent below?		
<b>Answer Options</b>	<b>Response Percent</b>	<b>Response Count</b>
Yes	13.3%	2
No	86.7%	13

Table 6: Demographics

<b>Question:</b>	<b>Answer Options</b>	<b>Response Percent</b>	<b>Response Count</b>
Do you buy your own laundry detergent?	Yes	100.0%	15
	No	0.0%	0
What gender do you identify as?	Male	73.3%	11
	Female	26.7%	4
	Other	0.0%	0
How old are you?	18 to 25	33.3%	5
	26 to 35	66.7%	10
Are you an OSU student?	Yes	80.0%	12
	No	20.0%	3

## CONCLUSIONS

Findings of this study suggest that consumers perceived the ecolabeled bottles as more sustainable than non-ecolabeled products, and were discerning enough to rank one ecolabeled bottle over another. The Design for the Environment ecolabel, which was displayed on the most highly ranked bottle, was also the most familiar to participants of the survey. This supports the general consensus that ecolabeled products are perceived as more sustainable than non-ecolabeled products, and that government-run ecolabels are more successful in signaling the sustainable nature of the products that displayed them. However, most respondents were not familiar with the labels used in the study, which suggests that consumers can still perceive one label as more sustainable than another, even when not familiar with the ecolabels.

### Limitations

Due to time constraints and low survey participation, it was not possible to account for variation due to pro-environmental orientation using the NEP scale or use more complex analysis methods.

Simplifying the survey to meet time requirements also meant that each bottle variant was shown at the same time, with only one variable (the ecolabel) changing on each bottle. This simplification is not realistic to what consumers would actually be faced with when purchasing laundry detergent at a grocery store. In addition, the OSU respondents of the survey aren't representative of the entire population, and the selection

of forestry grad students as participants introduces the risk of bias based upon their field of study, age and, gender (most respondents were males between 26 and 35 years old).

Finally, this study does not account for the impact different product packaging might have on the effectiveness of different logos, and participants were also not asked why they ranked the bottle variant over another or which they actually preferred. The impact of price variance on purchasing decisions was also beyond the scope of this study.

## **Future Work**

Future studies may want to include questions that identify why participants ranked bottles the way they did. For example, it would have been valuable to have asked participants if they had actually noticed the ecolabels at all, as one participant of the study later commented that he thought all the bottles in the survey were the same. Studies similar to this one may also want to use a scale such as the NEP to account for variation due to the pro-environmental orientation of consumers.

Other studies could use both different bottles and labels in their study, using conjoint analysis to determine which ecolabel had the most impact on consumer's perceptions of sustainability. This would also allow the impact of product packaging on ecolabel effectiveness to be examined. Another avenue of study would be to look at the elements of the ecolabels themselves and how they affect consumer preference.



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## APPENDIX

### \* 1. Effect of Eco-Labels in Context on Perceived Sustainability

#### Explanation of Research Study

This survey is part of Natalia Garza's undergraduate honors thesis on sustainability. Completion time for this survey is approximately 10 minutes. Participation in this study is voluntary and all answers will be anonymous. Participants may stop taking the survey at any time without penalty. The risks associated with being a participant in this study are minimal. The study is not designed to benefit participants directly. If you have questions about your rights or welfare as a participant, please contact the Oregon State University Institutional Review Board (IRB) Office, at (541) 737-8008 or by email at [IRB@oregonstate.edu](mailto:IRB@oregonstate.edu). If you have any questions about this study, contact [Chris.Knowles@oregonstate.edu](mailto:Chris.Knowles@oregonstate.edu) or (541) 737-1438.

Your selection of 'I agree' indicates that you understand the above information, are 18 years old or older, and agree to take part in this study.

☐ I agree

**\* 1. Listed below are statements about the relationship between humans and the environment. For each one, please indicate whether you **STRONGLY AGREE**, **MILDLY AGREE**, are **UNSURE**, **MILDLY DISAGREE** or **STRONGLY DISAGREE** with it.**

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

\* 1. Rank each laundry detergent below from ONE to FOUR, FOUR being the LEAST sustainable detergent, and ONE being the MOST sustainable detergent.

	1	2	3	4
Detergent A	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Detergent B	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Detergent C	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Detergent D	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>











**\* 1. Are you familiar with the following logos?**

	Yes	No
Logo A	<input type="radio"/>	<input type="radio"/>
Logo B	<input type="radio"/>	<input type="radio"/>
Logo C	<input type="radio"/>	<input type="radio"/>



\* 2. Are you familiar with the brand of laundry detergent below?

☐ Yes

☐ No



**\* 1. Do you buy your own laundry detergent?**

☐ Yes

☐ No

**\* 2. What gender do you identify as?**

☐ Male

☐ Female

☐ Other

**\* 3. How old are you?**

☐ 18 to 25

☐ 26 to 35

☐ 36 to 45

☐ 46 to 55

☐ 55+

**\* 4. Are you an Oregon State University student?**

☐ Yes

☐ No

