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# Consumer Perceptions of Eco-friendly and Sustainable Terms

**Benjamin Campbell, Hayk Khachatryan, Bridget Behe, Jennifer Dennis, and Charles Hall**

Common marketing strategies include emphasizing products' "green" or environmentally friendly attributes and characteristics to appeal to a growing market of environmentally conscious consumers. While previous studies have used product labels such as "eco-friendly," "environmentally friendly," and "sustainable" to investigate consumer preferences, relatively little is known about how consumer perceptions as a pre-decision mechanism impact their preferences and choice behaviors. Using data collected through an online survey of U.S. and Canadian consumers, we investigate systematic differences in individuals' perceptions of the terms "eco-friendly" and "sustainable." Marketing implications for the food and green (i.e., greenhouse/nursery producers, suppliers, and retailers) industries are discussed.

**Key Words:** choice behavior, environmental attributes, labels, perceptions, survey

Increasingly, consumer products are advertised by promoting their "green" or environmentally friendly attributes and characteristics to appeal to a larger consumer base or to gain a premium for the product. As noted by Truffer, Markard, and Wustenhagen (2001), this can be thought of as eco-labeling. Numerous terms fall within this eco-labeling context, but two, "eco-friendly" and "sustainable," are applied to a wide variety of products and are at the forefront of the green movement. As noted by Merriam-Webster (2013), the term "eco-friendly" originated in 1989 while "sustainable" has been around since 1727. Further, Greenbiz (2009) noted that 1,570 products claiming to be sustainable, eco-friendly, or "environmentally friendly" were launched in 2009, tripling the number launched three years earlier. Given the terms' longevity and increasing usage in the marketplace to inform and influence consumer decision-making, there is a growing need to understand how consumers perceive these terms.

Merriam-Webster (2013, web page) defines eco-friendly as "not environmentally harmful" and sustainable as "involving methods that do not completely use

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up or destroy natural resources." Perhaps from a more consumer-oriented perspective, the American Hotel and Lodging Association (2014, web page) defines the term eco-friendly as "a loose term often used in marketing to inform consumers about an attribute of a product or service that has an environmental benefit. This term does not necessarily indicate all attributes of a product or service are environmentally benign." The association defines the term sustainable as "meeting the needs of the present without compromising the ability of future generations to meet their needs." Thus, definitions of eco-friendly and sustainable vary and, unlike for organic labeling, there are no federal or state certifications to align definitions across products.

Consequently, terms such as eco-friendly and sustainable, hereafter referred to as EFS, have the potential to suffer from "greenwashing." As defined by EnviroMedia Social Marketing (2013, web page), "greenwashing is when a company or organization spends more time and money claiming to be 'green' through advertising and marketing than actually implementing business practices that minimize environmental impact." EnviroMedia Social Marketing (2013) goes on to note that greenwashing is a problem because it can cause confusion among consumers (e.g., they purchase a product that is perceived to be something it is not). Through such misinformation and false claims, consumers may have inaccurate information about terms associated with environmentally friendly products and may in some cases come to believe that environmental labeling is nothing more than a sales gimmick.

In regard to environmental labeling, the studies completed so far have focused mostly on understanding perceptions of the terms "organic" and "local"; only a few have examined EFS terms even though their use is widespread. Of the studies that have examined preferences and/or willingness to pay for EFS labels (Thompson and Kidwell 1998, Blend and Van Ravenswaay 1999, Wessels, Johnson, and Holger 1999, Moon et al. 2002, Mueller and Remaud 2010, Sirieix and Remaud 2010, Han, Hsu, and Lee 2009, Jhawar et al. 2012, Marette, Messéan, and Millet 2012), none investigated the role of consumers' perceptions of the terms in choice decision-making. However, as noted by Lusk et al. (2004), Pope and Jones (1990), and Cameron and Englin (1997), the way in which individuals perceive or intrinsically define concepts such as EFS may influence their choices.

Despite the rising use of EFS terms on product labels, little is known about the underlying perceptions and definitions associated with them. As with the terms local and organic (Ipsos Reid 2006, Campbell, Mhlanga, and Lesschaeve 2013), we hypothesize that consumers' perceptions and associations regarding EFS vary and can be both positive and negative (H1). We first compare perceptions of EFS of respondents who were already familiar with the terms to respondents who were not. Within this context, we examine how demographic, purchase-behavior, and other consumer characteristics affect whether consumers are familiar with EFS. We then focus on whether there is overlap between perceptions of EFS terms and other terms such as local and organic that have well-established definitions. We hypothesize that the meaning of EFS terms has begun to overlap the meaning associated with the certified term *organic* (H2), especially among individuals who have purchased increasing quantities of local and organic products. Finally, we identify demographic, purchase-behavior, and other consumer characteristics that play a role in respondents' perceptions of EFS terms as sales gimmicks and/or as associated with expensive products (H3). We then discuss the primary economic and marketing implications of

the study with an emphasis on cases in which the unregulated EFS terms are perceived as similar to the heavily regulated term *organic*.

## Methods

### Data

To better understand consumer perceptions, associations, and definitions of EFS terms, we initiated an online survey in spring of 2011. Using a database from Global Marketing Insite, Inc. (GMI), we surveyed consumers on a variety of purchase behaviors, environmental attitudes, demographic characteristics, and their perceptions of EFS terms. Potential survey respondents were contacted by GMI and invited to participate, and interested consumers were directed to follow a link to the survey online. Of the 2,700 consumers contacted, 2,511 completed the survey; 68 percent were from the United States and 32 percent were from Canada. Each of the 48 contiguous U.S. states and all of the Canadian provinces were represented in the survey<sup>1</sup> with states and provinces that had larger populations sampled at a higher rate.

We endeavored to obtain a representative sample (based on 2010 census estimates) reflecting overall mean demographics for the United States and Canada. Our U.S. sample had an average age of 35.8 (compared to the U.S. census estimate of 37.2) and was 78.1 percent Caucasian (U.S. census average was 78.1 percent). Our U.S. sample differed statistically from the census in terms of average household income (\$65,273 vs. \$52,762 in the census) and gender (males were 58.3 percent vs. 49.2 percent in the census). With regards to our Canadian sample, the average age (42.7 vs. 39.7 in the census), average household income (\$66,747 vs. \$69,860 in the census), and gender proportion (49.6 percent vs. 48.6 percent in the census) in our sample were statistically equivalent to averages for the Canadian population. The terms used in our ethnicity question (in line with the U.S. census methodology) are not directly comparable to the terms used in the Canadian census and how responses were calculated; however, our rough calculations indicate that the Canadian population is about 80 percent Caucasian, which is less than our sample average of 86 percent.

The survey asked questions related to demographics (i.e., household income and characteristics, education, marital status, age, gender, and ethnicity), purchase behaviors (i.e., identity of the primary shopper in the household, the types of stores generally shopped in, and purchases of local and organic produce), and recycling habits (i.e., frequency of recycling a number of materials). With regard to the questions of interest, we first asked respondents whether they had heard of the EFS terms (first eco-friendly and then sustainable). This question allows us to directly address H1: consumers who are familiar with the EFS terms have different profiles than consumers who are not. We tested our second and third hypotheses (H2: perceptions of the terms local, organic, sustainable, and eco-friendly overlap; H3: consumers who view EFS terms as gimmicks will have a different profile from consumers who do not) by asking respondents to mark all of the characteristics provided in a list that they perceived as representing EFS (Table 1). The list presented in the survey

<sup>1</sup> Hawaii and Alaska were not included since perceptions in those states could be different than the typical U.S./Canadian consumer given differences such as transporting product to those areas.

was finalized after discussions with experts in the horticultural (comprising both food and nonfood products) industry and a review of the literature. Given the increasing use of the EFS terms, we did not ask consumers to consider the terms in the context of a specific product or product type. Rather, we asked for their perceptions in a general context so we could better understand the overall connotation associated with them. The list included an entry for "some other characteristic not listed" to capture any omitted characteristics.

We acknowledge two aspects of the survey that could potentially affect interpretation of our results. First, the question on the term sustainable was always presented after the question on the term eco-friendly, which could bias the answers regarding sustainable. However, as shown in Table 1, there is little overlap of responses to those questions. Second, respondents were asked about their *current* perceptions of EFS terms. Consumers might have instead described what they thought the terms *should mean*, which could weaken some of the conclusions. However, we believe that the majority of the respondents provided current perceptions and our discussion proceeds accordingly.

### Analysis

To determine whether there are differences in respondents who had and had not heard of the EFS terms, we compared the mean for each group using a *t*-test. We wanted to understand the relationship between respondents' demographic and purchase-behavior characteristics and (i) whether they had heard of a term and (ii) their perceptions of the term. Using a binary logit model and corresponding marginal effects, we can examine the impact of the explanatory variables (e.g., demographics and purchase behaviors) on the question of interest.

We address eco-friendly first. We assigned a value of 1 to respondents who indicated that they had heard of the term and a value of 0 to respondents who indicated that they had not. Once coding was completed, we used a binary logit model such that the binary logit probability could be modeled as

$$(1) \quad P_i = 1 / (1 + e^{-x_i'\beta})$$

where  $P_i$  is the probability of the  $i^{\text{th}}$  respondent choosing the characteristic,  $x_i$  is a set of explanatory variables (e.g., demographic characteristics, purchase behaviors, recycling behaviors, and beliefs about environmental terms), and  $\beta$  represents the coefficients to be estimated. After obtaining the log-odds from the binary logit model, we determined the corresponding marginal effects.<sup>2</sup> We then modeled the question regarding the term sustainable in the same manner. Both models used the entire sample of U.S. and Canadian respondents. The variables for each model were chosen based on a review of previous studies, notably studies about the terms organic and local. We included recycling behaviors and beliefs about the terms local and organic as proxy variables to better understand the environmental mindset of the respondents; those results are provided in an appendix available from the authors.<sup>3</sup>

<sup>2</sup> Marginal effects for continuous explanatory variables can be interpreted as the percent change given a one-unit increase from the mean. For a dummy explanatory variable, the marginal effect is the percent change given a move from the base category to the category of interest.

<sup>3</sup> Full tables are available in an appendix; contact the author or see <http://public.homepages.uconn.edu/~bec12003>.

**Table 1. Percentage of Survey Participants from the United States and Canada Associating Various Characteristics with Sustainable and Eco-friendly**

Attributes	Eco-friendly Perception						Sustainable Perception					
	Canada			United States			Canada			United States		
	Have Not Heard	Have Heard	Diff.	Have Not Heard	Have Heard	Diff.	Have Not Heard	Have Heard	Diff.	Have Not Heard	Have Heard	Diff.
Have heard of eco-friendly (sustainable)?	5	95		8	92		23	77		26	74	
Green	43	78	***	34	78	***	24	52	***	25	49	***
Locally produced or sourced	18	33	**	10	28	***	14	26	***	7	22	***
Organic	35	53	**	23	53	***	14	28	***	19	28	***
Reduced greenhouse gases	20	68	***	13	61	***	14	38	***	10	32	***
Expensive or pricey	5	28	***	9	27	***	11	16		12	15	
Socially responsible	20	56	***	11	53	***	24	62	***	18	48	***
Global warming	15	44	***	17	41	***	13	22	***	9	21	***
Energy savings, efficient, conservation	25	77	***	24	75	***	28	54	***	20	51	***
Lower carbon footprint	15	68	***	16	62	***	13	42	**	9	36	***
Sales or marketing gimmick	0	16	***	8	17	***	12	9		5	11	***
Certified or certification	8	25	***	10	17	**	13	16	***	8	15	***
Best management practices	5	25	***	8	20	***	20	47	***	12	37	***
Biodegradable	33	71	***	17	68	***	16	36	***	15	37	***
Recycling	30	76	***	33	75	***	22	37	***	18	38	***
Some other characteristic not listed	8	1	***	4	1	***	6	3	**	9	3	***

Note: \*, \*\*, and \*\*\* represent the statistical difference between those who have and have not heard of the terms by country at a 0.1, 0.05, and 0.01 significance level respectively. For instance, of consumers who had heard of eco-friendly, 33 percent perceived it to be locally produced, which is significantly more than the 18 percent who perceived it to be locally produced but had not heard of eco-friendly.

The final step in the analysis examined links between purchase behavior and respondents' demographic characteristics. Following the model set-up in equation 1, we used the dependent variable to represent the selected characteristic. We started with eco-friendly, coding a characteristic of eco-friendly (e.g., a respondent perceived "green" as a characteristic of eco-friendly) as 1 and all nonselected characteristics as 0. The same was done for sustainable. Once coding was completed, we modeled the eco-friendly and sustainable characteristics separately using a binary logit model such that the binary logit probability could be modeled as in equation 1 and again used the entire sample of U.S. and Canadian respondents.

## Results

### *Heard of Term*

Given how commonly EFS terms are used in the marketplace, it is important to understand the types of consumers who have and have not heard of those terms. As noted in Table 1, we find that 5 percent of the Canadian respondents and 8 percent of the U.S. respondents were not familiar with the term eco-friendly and that 23 percent of the Canadian respondents and 26 percent of the U.S. respondents were not familiar with the term sustainable. We then examined differences in perceptions of the characteristics that make up the terms between people who were familiar with them and people who were not, and significant differences are readily apparent for most of the characteristics. Among the Canadian respondents, for instance, 43 percent of those who had not heard of the term eco-friendly characterized it as green while 78 percent of those familiar with the term perceived it as green. Among U.S. respondents, only 25 percent of those who had not heard of sustainable perceived it as green while 49 percent of those who were familiar with the term viewed it as green. We see the same pattern emerge for all of the environmental characteristics (reduced greenhouse gases, energy saving, lower carbon footprint). Respondents who had heard of the EFS terms were significantly more likely to perceive an environmental characteristic as an attribute of eco-friendly and sustainable than respondents who had not heard of the EFS terms.

Terms that have stricter definitions due to federal and state legislation (i.e., locally produced, organic, and certified) also are more often associated with EFS terms in both Canada and the United States. For instance, 53 percent of respondents in the United States and 53 percent of respondents in Canada who had heard of the term eco-friendly perceived organic as one of its characteristics. And although only 28 percent of Canadian and 28 percent of U.S. respondents perceived organic as a characteristic of sustainable, that was still significantly higher than the percentage for respondents who had not heard of the term. Further, we see that "sales or marketing gimmick" was associated with EFS for a relatively small percentage of the respondents; eco-friendly was viewed as a gimmick by 8 percent of U.S. respondents who had not heard of the term previously and by 16 percent of Canadian respondents and 17 percent of U.S. respondents who had heard of the term.

Viewing these results in context, we find that products marketed as eco-friendly and/or sustainable are likely to have both an advantage and a disadvantage relative to other products. The advantage is that firms still have opportunities to more concretely define the terms for consumers (more

so for sustainable) given the overall lack of familiarity with them. Firms potentially have a particular advantage over local and organic producers since a large subset of respondents equated local and organic with eco-friendly and sustainable. Given current regulations for organic products and limits on labeling a product as locally produced, firms offering products labeled as eco-friendly and/or sustainable could potentially operate in a less strictly regulated environment. The disadvantage lies in the consumers who perceive EFS labels as a sales gimmick or as applied to products that are overly expensive.

Though these results provide important information to marketers, they are not specific enough to allow for inferences about how consumers would respond to products labeled with these terms. Notably, two questions arise: (i) What respondent characteristics correlate with a person who has not heard of the term? (ii) Could some respondent characteristics allow firms to better understand consumer perceptions?

#### *Marginal Effects: Heard of Term*

One of our primary goals is to understand how specific respondent characteristics influence whether a consumer has heard of EFS terms. Thus, we focus specifically on demographic characteristics and purchase behaviors with the results reported in Table 2. Other factors (e.g., the importance of buying local and organic) and actions (e.g., recycling) could influence whether a respondent has heard of the EFS terms so we include them in the model but exclude them from Table 2.

An evaluation of the results shown in Table 2 provides some interesting insights. We first examine the demographic characteristics. We find that for every child in the household above the mean there is a 0.9 percent decrease in the probability that a respondent has heard of eco-friendly and a 3.8 percent decrease in the probability that a respondent has heard of sustainable. Educational attainment played a role only for sustainable—a respondent who had a high school diploma, some college, or a bachelor's degree was less likely to have heard of sustainable than a respondent who had not graduated from high school. Caucasian consumers were 2.2 percent more likely to be familiar with eco-friendly and 6.4 percent more likely to be familiar with sustainable than non-Caucasian consumers. We also find that income has a positive impact on familiarity with sustainable but has no impact on familiarity with eco-friendly.

Of particular interest is the result that consumers who purchase more local produce are more likely to have heard of both eco-friendly (1.4 percent) and sustainable (3.3 percent). Further, respondents who purchase more organic produce are more likely to have heard of sustainable. These results do not indicate whether respondents use the term to make their purchase decisions but do indicate that there is a link between having heard of the terms and purchasing local and organic products. When viewed in conjunction with the other demographic results, this finding provides insight into the types of consumers who have heard of the terms, which firms can use to determine how to increase awareness about a particular term.

#### *Marginal Effects: By Perception*

Table 3 reports the results of the binary logit model for perceptions of certified, locally produced, and organic as characteristics of the EFS terms for demographic

factors. Values shown in bold represent statistically significant coefficients at the 0.10 level. First, it is apparent that U.S. and Canadian consumers view the terms differently. For instance, relative to Canadian respondents, U.S. respondents were 6.4 percent less likely to perceive certified as a characteristic of eco-friendly. For sustainable, U.S. respondents were 3.8 percent less likely to associate certified and 3.3 percent less likely to associate locally produced with sustainable. These results are most likely the result of a variation in environmental awareness between U.S. and Canadian consumers caused by different environmental regulations in the two countries.

In terms of gender, we see that men were less likely to perceive locally produced or organic as eco-friendly while gender has no impact on perceptions of sustainable. This result is potentially troublesome for organic and local producers. Firms that market their products as organic or local are subject to various regulations associated with those terms that do not apply to eco-friendly. Given that women tend to do more of the household shopping than

**Table 2. Marginal Effects from the Binary Logit Model Associated with Having Heard of Eco-friendly and Sustainable**

	Have Heard of Eco-friendly		Have Heard of Sustainable	
	Coefficient	p-Value	Coefficient	p-Value
Country (United States = 1)	-0.006	0.436	-0.0003	0.988
Age	0.000	0.989	-0.0010	0.156
Number of adults in household	0.002	0.448	-0.0100	0.186
Number of children in household	<b>-0.009</b>	0.002	<b>-0.0380</b>	0.000
Income <sup>a</sup>	0.000	0.627	<b>0.0045</b>	0.064
Gender (male = 1)	<b>-0.021</b>	0.001	<b>0.0494</b>	0.008
Household area: suburban	0.000	0.993	0.0220	0.309
Household area: rural	-0.003	0.734	0.0299	0.233
Educ: high school to some college	-0.015	0.189	<b>-0.1488</b>	0.000
Educ: bachelor's degree	-0.002	0.797	<b>-0.0829</b>	0.001
Educ: greater than bachelor's degree	-0.008	0.517	-0.0179	0.622
Race (Caucasian = 1)	<b>0.022</b>	0.030	<b>0.0636</b>	0.011
Purchased plants during last year	0.000	0.978	<b>0.0493</b>	0.018
How often purchased local produce when local was available	<b>0.014</b>	0.000	<b>0.0328</b>	0.007
How often purchased organic produce when organic was available	0.004	0.390	<b>0.0404</b>	0.001
Log pseudo-likelihood	-513.3		-1,304.1	
Wald chi-square	222.3		237.2	
Prob > chi-square	0.000		0.000	
Pseudo R-square	0.203		0.103	

<sup>a</sup> Coefficient represents a \$10,000 change from the mean income.

**Table 3. Marginal Effects from the Binary Logit Model Associated with the Perception that an Attribute is Eco-friendly or Sustainable**

Variable	Eco-friendly Perception						Sustainable Perception					
	Certified		Locally Produced		Organic		Certified		Locally Produced		Organic	
	Coeff.	p-Value	Coeff.	p-Value	Coeff.	p-Value	Coeff.	p-Value	Coeff.	p-Value	Coeff.	p-Value
Country (United States = 1)	<b>-0.064</b>	0.001	-0.035	0.109	0.002	0.949	<b>-0.038</b>	0.026	<b>-0.033</b>	0.085	0.000	0.992
Age	<b>-0.002</b>	0.002	-0.001	0.188	<b>-0.002</b>	0.065	<b>-0.001</b>	0.010	-0.001	0.362	-0.000	0.525
Number of adults in household	-0.007	0.276	-0.010	0.232	-0.005	0.581	<b>0.010</b>	0.043	-0.009	0.196	0.011	0.136
Number of children in household	-0.007	0.395	0.001	0.937	0.005	0.654	0.008	0.204	0.003	0.681	0.014	0.107
Income <sup>a</sup>	0.002	0.306	-0.004	0.154	<b>-0.005</b>	0.084	0.002	0.216	-0.003	0.184	-0.001	0.623
Gender (male = 1)	-0.002	0.918	<b>-0.051</b>	0.006	<b>-0.046</b>	0.039	0.009	0.482	-0.018	0.255	0.021	0.259
Household area: suburban	-0.007	0.720	0.030	0.170	-0.030	0.249	-0.007	0.649	0.007	0.685	0.010	0.642
Household area: rural	0.022	0.382	0.043	0.146	0.034	0.299	0.017	0.430	0.020	0.413	0.004	0.895
Educ: high school to some college	-0.030	0.165	0.005	0.873	0.073	0.023	0.013	0.563	<b>-0.040</b>	0.062	0.025	0.375
Educ: bachelor's degree	-0.009	0.624	0.024	0.285	<b>0.059</b>	0.027	0.027	0.108	0.003	0.858	<b>0.038</b>	0.096
Educ: greater than bachelor's degree	0.006	0.812	0.023	0.496	0.039	0.300	0.011	0.656	-0.009	0.718	0.003	0.915
Race (Caucasian = 1)	-0.002	0.930	0.014	0.570	0.013	0.636	-0.004	0.806	-0.007	0.745	-0.007	0.783
Purchased plants during last year	<b>0.031</b>	0.076	0.006	0.795	0.044	0.077	0.017	0.259	0.014	0.451	0.025	0.232
Heard of term eco-friendly (1 = yes)	<b>0.068</b>	0.025	<b>0.103</b>	0.006	<b>0.172</b>	0.000	0.022	0.436	0.050	0.163	-0.004	0.929
Heard of term sustainable (1 = yes)	<b>0.060</b>	0.001	<b>0.093</b>	0.000	0.065	0.014	<b>0.044</b>	0.002	<b>0.108</b>	0.000	<b>0.084</b>	0.000
How often purchased local prod. <sup>b</sup>	-0.003	0.780	<b>0.026</b>	0.047	0.012	0.411	-0.008	0.417	-0.005	0.617	0.018	0.165
How often purchased organic prod. <sup>b</sup>	0.009	0.337	0.012	0.322	<b>0.037</b>	0.008	0.019	0.020	<b>0.027</b>	0.010	<b>0.041</b>	0.001
Log pseudo-likelihood	1,151.7	1,364.1		629.7			-902.2		-1,090.6		-1,271.3	
Wald chi-square	124.9	208.5		182.9			105.2		160.2		157.3	
Prob > chi-square	0.000	0.000		0.000			0.000		0.000		0.000	
Pseudo R-square	0.054	0.084		0.063			0.0609		0.089		0.073	

<sup>a</sup>Coefficient represents a \$10,000 change from the mean income.<sup>b</sup>Scale is a 1-5 Likert scale with 1 = never and 5 = always.

Notes: Base categories are Canada, urban household, less than high school diploma, other race, did not purchase plants, have not heard of eco-friendly, have not heard of sustainable.

men (Zepeda 2009, Flagg et al. 2013, Wolfe 2013), the fact that women are more likely to associate local and organic with eco-friendly offers firms opportunities to take business from local and organic producers while not having to obtain certifications. Local and organic producers have made environmental concerns their hallmark, but in doing so, they have opened a door to eco-friendly potentially being used to some extent as a proxy for organic.

Further examination of Table 3 indicates that respondents who had a bachelor's degree were 5.9 percent more likely to associate organic with eco-friendly and 3.8 percent more likely to associate organic with sustainable. This result is interesting since respondents with bachelor's degrees were less likely to have heard of sustainable. One potential explanation is that relatively highly educated respondents are more aware of organic messaging that says that organic products are environmentally friendly, thereby making a link between environmental terms and organic. Results of a recent paper by Campbell et al. (2014) support this interpretation; they found that relatively highly educated consumers related environmental benefits such as reductions in carbon footprints and greenhouse gas emissions to organic. An alternate explanation is that relatively highly educated consumers answer the question in terms of what sustainable should be and not how they currently view it. However, since we do not see education playing a role in whether a respondent had heard of eco-friendly, we believe respondents answered the question in terms of how they currently viewed it. Assuming that respondents answered the question as asked (provided their current view of the term), our results raise the possibility that respondents with more education may see an eco-friendly label and incorrectly assume that the product is organic.

### *Local and Organic Competition*

As shown in Table 1, most consumers perceive eco-friendly and sustainable as indicating some type of environmental measure, notably a positive environmental circumstance. This was not unexpected since marketing generally uses the terms in that manner (Yue et al. 2011, Hall et al. 2010). However, the more interesting question is how consumers who purchase local and organic products perceive these terms, especially given the considerable resources being invested by "buy local" and "buy organic" groups. For this reason, we include the marginal effects from the binary logit for environmental perceptions in an appendix while focusing our attention on the marginal effects that are directly related to the local and organic terms.

Table 3 shows that several demographic characteristics and purchase behaviors have a significant effect on the probability of a consumer perceiving a characteristic as part of the EFS terms. For instance, U.S. consumers were 6.4 percent less likely to perceive *certified* as a characteristic of eco-friendly and 3.8 percent less likely to perceive it as a characteristic of sustainable than Canadian consumers. In addition, they were 3.3 percent less likely to perceive *locally produced* as a characteristic of sustainable.

Of particular interest are the demographic characteristics and purchase behaviors that are linked to higher levels of purchases of local and organic products. For instance, consumers who purchase local produce more frequently are 2.6 percent more likely than other consumers to perceive the term locally produced as a characteristic of eco-friendly. With respect to the term organic, we see the potential for producers to use eco-friendly and sustainable as

alternatives to organic, especially when marketing to consumers who purchase organic products. For example, consumers who purchase organic products more frequently are 3.7 percent more likely than other consumers to perceive organic as a characteristic of eco-friendly and 4.1 percent more likely to perceive organic as a characteristic of sustainable. These results do not imply that a consumer will purchase a product labeled as eco-friendly or sustainable over a product labeled local or organic; rather, it indicates that eco-friendly and sustainable could be used as alternative terms either to differentiate a product or to avoid local or organic labeling laws that stipulate specific boundaries or production practices.

Note also that younger consumers who had heard of the EFS terms were more likely to associate them with certification. Since certification is a hallmark of organic products, this association among younger consumers between certification and other environmental types of messages should be a concern for organic producers. Producers using EFS labeling not only do not have to pay for certification but could easily impact organic brands if the environmental claims are not the same as those made by organic producers.

### *Sales Gimmick and Expensive*

As more and more environmental terms enter the marketplace, some terms may be diluted because consumers come to perceive the messages as gimmicky and negative. Such skepticism is often referred to as a loss in authenticity (Behe et al. 2010). As shown in Table 1, 9–17 percent of the respondents in our sample who had heard of the terms perceived them as sales gimmicks and 15–28 percent perceived them as indicating that the products were expensive. We present the results of this analysis in Table 4, where values in bold represent statistical significance at the 0.10 level. The marginal effects presented in Table 4 show that younger consumers are more likely than older consumers to perceive eco-friendly as denoting expensive and to perceive both eco-friendly and sustainable as sales gimmicks. We also see that familiarity with the term eco-friendly increases the likelihood of perceiving both terms as denoting expensive and gimmicky. For instance, familiarity with eco-friendly increased the probability of associating eco-friendly with expensive by 16.1 percent and of associating eco-friendly with a sales gimmick by 6.9 percent (Table 4). This finding indicates that some consumers are becoming skeptical of new terminologies, leading to negative connotations for them. Also of interest is the finding that rural consumers are 4.6 percent more likely than urban consumers to perceive eco-friendly as a sales gimmick.

## **Conclusions**

Our goal was to better understand consumer perceptions of the frequently used terms eco-friendly and sustainable. We hypothesized that consumers' perceptions would be influenced by whether they were already familiar with the terms (H1), that the terms are beginning to be associated with local and organic products (H2), and that a definable subset of consumers has a negative association with the terms as being sales gimmicks or denoting expensive products (H3).

Using an online survey of U.S. and Canadian consumers, we find that several consumer characteristics are associated with whether a person has heard of

**Table 4. Marginal Effects from the Binary Logit Model Associated with the Perception that an Attribute is Eco-friendly or Sustainable**

Variable	Eco-friendly Perception						Sustainable Perception		
	Expensive		Sales Gimmick		Expensive		Sales Gimmick		
	Coeff.	p-Value	Coeff.	p-Value	Coeff.	p-Value	Coeff.	p-Value	
Country (United States = 1)	-0.029	0.186	-0.009	0.586	<b>-0.049</b>	0.009	-0.007	0.621	
Age	<b>-0.002</b>	0.026	<b>-0.002</b>	0.001	0.000	0.486	<b>-0.001</b>	0.008	
Number of adults in household	0.009	0.227	-0.005	0.411	0.003	0.564	0.006	0.170	
Number of children in household	0.006	0.558	-0.005	0.533	-0.005	0.483	-0.001	0.818	
Income <sup>a</sup>	-0.003	0.279	0.002	0.145	0.002	0.263	0.000	0.790	
Gender (male = 1)	-0.017	0.359	<b>0.037</b>	0.008	0.018	0.223	0.011	0.353	
Household area: suburban	-0.008	0.697	-0.008	0.659	-0.001	0.948	0.006	0.664	
Household area: rural	0.004	0.878	<b>0.046</b>	0.054	0.015	0.504	<b>0.038</b>	0.067	
Education: high school to some college	-0.010	0.699	-0.029	0.130	0.011	0.610	0.001	0.955	
Education: bachelor's degree	0.027	0.218	0.001	0.970	-0.009	0.574	0.009	0.486	
Education: greater than bachelor's degree	0.030	0.363	-0.012	0.582	0.012	0.643	0.016	0.461	
Race (Caucasian = 1)	0.030	0.197	0.003	0.877	0.006	0.735	-0.009	0.547	
Purchased plants during last year	<b>0.050</b>	0.011	0.003	0.839	0.010	0.506	<b>0.023</b>	0.056	
Heard of term eco-friendly (1 = yes)	<b>0.161</b>	0.000	<b>0.089</b>	0.000	-0.003	0.930	0.004	0.874	
Heard of term sustainable (1 = yes)	<b>0.069</b>	0.001	<b>0.073</b>	0.000	<b>0.031</b>	0.056	0.017	0.208	
How often purchased local produce <sup>b</sup>	-0.010	0.423	-0.007	0.461	0.006	0.518	0.003	0.706	
How often purchased organic produce <sup>b</sup>	-0.013	0.235	0.000	0.971	-0.001	0.873	<b>0.012</b>	0.095	
Log pseudo-likelihood	324.4		96.8		-945.5		-716.9		
Wald chi-square	184.9		156.8		75.1		78.2		
Prob > chi-square	0.000		0.000		0.000		0.000		
Pseudo R-square		0.0773		0.0775		0.0396		0.0528	

<sup>a</sup>Coefficient represents a \$10,000 change from the mean income.<sup>b</sup>Scale is a 1-5 Likert scale with 1 = never and 5 = always.

Note: Base categories are Canada, urban household, less than high school diploma, other race, did not purchase plants, have not heard of eco-friendly, have not heard of sustainable.

the terms: number of children in the household, gender, race, and purchases of local and organic produce. With this in mind, firms that market their products using eco-friendly and/or sustainable terms will want to consider the consumer segments most likely to value such terms as well as opportunities to educate consumers about the terms' meanings. Consumers who are already familiar with the terms may not accurately understand them.

Since eco-friendly and sustainable are not regulated, there is potential for greenwashing by firms to take advantage of consumers who misconstrue them. For instance, eco-friendly and sustainable tend to be familiar to consumers who purchase local and organic produce. As consumers purchase increasing amounts of local and organic produce, they are more likely to associate organic and locally produced with eco-friendly and sustainable. This could potentially directly impact local and organic labeling strategies for producers. For instance, a firm could forgo organic labeling (and associated certification costs) if its consumer base accepts sustainable as organic. Perhaps just as likely is a firm using eco-friendly and/or sustainable labels to differentiate its products and compete directly with organic and/or local producers. In either case, the local and organic brands could be eroded, allowing firms to "stretch" the definition of the terms to capture consumers interested in local and organic products.

As a whole, the results have important implications for marketing of food and the green industry (greenhouse and nursery producers, suppliers, and retailers). As the presence of various product claims and especially environmental claims continues to grow, firms will have to be proactive to insure that their messages do not get lost in the crowd or fall victim to incorrect perceptions. Firms marketing products using terms that are subject to regulation (e.g., certified, organic, and local) must be cognizant of how other environmental terms impact their messaging and marketing. Because many firms lack the resources and capability to conduct such research, this study provides useful insights regarding eco-friendly consumers that firms can incorporate into their marketing strategies.

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