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"Look at Me, I'm Buying Organic": The Effects of Social Pressure on Organic Food Purchases

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We investigate whether consumers purchase organic foods to demonstrate social status to others. Subjects were asked to choose among organic and nonorganic milk and apples in a control group and treatments in which: i) an image of another person's eyes was displayed, ii) responses appeared to not be anonymous, or iii) a vignette placed the choice in the presence of an acquaintance. The vignette treatment increased the willingness-to-pay (WTP) premium for organic by about 90%. The other treatments did not have significant overall effects. When exposed to another person's eyes, more educated respondents increased their WTP for organic.

Key words: conspicuous consumption, consumer, social desirability, social status, vignette

"Tell me what you eat, and I will tell you what you are." (Jean Anthelme Brillat-Savarin, 1825)

Introduction

The demand for organic foods in the United States continues to grow in spite of higher prices relative to conventionally produced products.[1] Total U.S. organic sales increased from $3.6 billion in 1997 to $39 billion in 2014 (Organic Trade Association, 2015), the market share of organic food increased from below 2% in 2004 to about 4% in 2011, and about 75% of grocery stores now sell organic foods (U.S. Department of Agriculture, 2014b). Despite the growth in the organic food market, debates remain about the factors driving the demand for organic foods. Previous studies have claimed that consumers prefer organically grown foods because of health concerns (Aertsens et al., 2009; Chen, 2009; Hjelmar, 2011; Rimal, Moon, and Balasubramanian, 2005; Schifferstein and Ophuis, 1998; Żakowska Biemans, 2011), perceived taste (Aertsens et al., 2009; Hjelmar, 2011; Schifferstein and Ophuis, 1998), perceived environmental benefits (Allen and Kovach, 2000; Chen, 2009; Hjelmar, 2011; Honkanen, Verplanken, and Olsen, 2006; Kim and Chung, 2011; Lockie et al., 2002; Schifferstein and Ophuis, 1998), perceived benefits to small or local farmers (Briggeman and Lusk, 2011; Chang and Lusk, 2009; Meas et al., 2015), improved animal welfare (Harper and Makatouni, 2002; Hjelmar, 2011; Lockie et al., 2002; Schifferstein and Ophuis, 1998), and other factors (Lusk and Briggeman, 2009; Lusk, 2011).

In addition to the possible effects related to product attributes, demand for organic food may also be driven by social pressure. Celebrities and other high-profile individuals have explicitly endorsed organic foods. For example, the author Sophie Uliano on the Oprah Winfrey show (2006) said that

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[1] The organic premium for russet potatoes, green leaf lettuce, and carrots at the San Francisco terminal is 150%, 55%, and 217%, respectively (U.S. Department of Agriculture, 2014b).

"organic farming protects the planet, so it is a win–win," and *Martha Stewart Living* (2010) magazine encouraged readers to "buy organic whenever you can." Such pronouncements may have created a social norm in which buying organic food is perceived as the "right thing" to do.

Several previous studies have found subjective norms (measured with survey questions like "Most people who are important to me would think that I should buy organic") are positively correlated with stated intentions to buy organic (Arvola et al., 2008; Ruiz de Maya, López-López, and Munuera, 2011; Zagata, 2012). In fact, using survey data collected from over 8,000 Europeans, Ruiz de Maya, López-López, and Munuera (2011, p. 1774) conclude that "subjective norms are the main underlying factor driving consumer behavior concerning [organic] products." Other studies, such as those by Lusk and Briggeman (2009), have shown that consumers are more likely to say they would choose organic food for themselves as compared to what they predict others would do. Lusk and Norwood suggest the results may be due to social pressure causing consumers to answer in a way that places them in the most positive light.

A last line of evidence pointing to the role of social influences in organic food demand comes from research suggesting that organic labels bias taste and health judgements (Lee et al., 2013; Schuldt and Schwarz, 2010). These studies suggest that organic labels create a halo effect—making food seem tastier or healthier than it really is. If organic labels produce halos that improve taste and perceived health, it also seems plausible that the halo could extend to a person's self-image as well—particularly when their choices are observed by others.

Despite this previous work, it has been difficult to identify the causal influence of social pressure on organic food demand. Existing evidence comes from correlations between self-reported subjective norms and purchase intentions (Zagata, 2012) or from approaches that infer the effects from a pattern of choice behavior (Lusk and Briggeman, 2009), but these effects may be confounded with other factors. In this paper, we observe consumers' choices among organic and conventional apples and milk in an experimental control and in three treatments designed to alter social influences by i) using a vignette (see Kapteyn, Smith, and van Soest, 2007) that places the respondent in a position where others can observe their shopping behavior, ii) showing an image of a person's eyes (see Bateson, Nettle, and Roberts, 2006) while the respondent makes their choices, or iii) eliciting the person's name and location just prior to asking them to make food choices. We find evidence of social pressure. The mean willingness to pay (WTP) for organic milk and organic apples increases in each of the treatments relative to the control, although the size and significance of the effects vary by treatment and respondent characteristics.

Before proceeding, it is useful to link this work to the broader literature on social influences on demand. In 1899, Veblen introduced the concept of "conspicuous consumption," arguing that when a society starts to produce a surplus, the amount of private property acquired directly reflects one's status, and the two most effective ways to show off the possession of wealth are to increase i) leisure activities and ii) expenditures on consumption and services. Veblen argues that the utility of conspicuous consumption includes not only the utility derived from the intrinsic attributes of a specific good but also that from achieving social status by displaying wealth.

After Veblen, many researchers have argued for the existence of social status effects tied to consumption. Hirsch (1976) introduced "positional goods," commodities that reflect one's class in the social hierarchy. He argues that utility is gained by having a higher income (not just high income) and consumption relative to others. Likewise, Bourdieu (1984) explained consumption behavior as a way to show and perpetuate social class, thereby maintaining a society's power structures. Following those papers, many researchers in various fields determined that social status can be a fundamental element in purchasing goods (Batley et al., 2001; Dastrup et al., 2012; Getzner, 2000; Griskevicius, Tybur, and Van den Bergh, 2010; Hidrue et al., 2011; Pietrykowski, 2004; Sexton and Sexton, 2014). These past studies primarily looked at items perceived to be "green," such as electric vehicles. None of these past studies have considered the possibility of a food item conferring social status.

Methods

To elicit the effect of social pressure on organic food purchases, we measure WTP for attributes of apples and milk and then compare WTP among treated groups to that of a control group. We chose apples and milk as research objects because fruits and vegetables and dairy—for which apples and milk are representative goods—are the two biggest categories of organic food sales in the United States, with 43.3% and 14.6%, respectively, of total market sales. (U.S. Department of Agriculture, 2014a). We developed an online survey and sent it to organic food consumers in the United States. The survey contained two choice experiments (CE). In the first, consumers made choices between two apples; in the second, consumers chose from among four types of milk with varying attributes.

Survey Design

Treatments for Eliciting Social Pressure Effect

Figure 1 shows the three variations in the questionnaire designed to induce social pressure. We also used a control (CTRL) that had none of the three treatments.

The first treatment (hereafter EYE) exposes respondents to an image of eyes. Bateson, Nettle, and Roberts (2006) provided evidence that exposure to an image of eyes creates the aura of being watched, which increases reputational concerns and cooperative behavior. They examined the effect that an image of a pair of eyes had on contributions to an honesty box to collect money for drinks; people paid almost three times as much for their drinks when shown an eye image relative to a control image. Ernest-Jones, Nettle, and Bateson (2011) found similar results in a field experiment. They displayed posters with eye images, made people more likely to clear waste from their tables in a self-clearing cafeteria. Both studies suggest that displaying eye images has a substantial effect on reputational concerns. The method has been used in various research fields, especially social science (Conty et al., 2010; Ekström, 2012; Powell, Roberts, and Nettle, 2012).

In the second treatment (hereafter NAME), we induced social pressure by asking respondents to type in their first name. In particular, we asked respondents to write their first name early in the survey and then later mentioned the respondent by name just before the CE began. To further increase social pressure, we used the respondents' Internet protocol (IP) address information to identify their location and asked respondents to confirm their state and city of residence. In short, we attempted to remove the perception of anonymity and place the decision-making context in a light in which respondents perceived that choices could be matched with individuals.[2] Previous research has suggested that anonymity (or lack thereof) has a significant influence on human behavior in a variety of settings related to social pressure (Akerlof and Kranton, 2000; Burnham, 2003; DellaVigna, List, and Malmendier, 2009; Fisher, 1993; Panagopoulos, 2010). Hoffman, McCabe, and Smith (1996), for example, showed that giving behavior in the Dictator game was influenced by whether the participant was anonymous to the experimenter.

In the third treatment (hereafter FRND), we presented respondents with a vignette, as in Kapteyn, Smith, and van Soest (2007). In particular, we framed the choice task as one in which the respondent shops with an acquaintance, such as a sibling of a good friend. Alexander and Becker (1978) argued that using vignettes helps standardize the social stimulus across respondents and also makes the decision-making situation more realistic. The vignette approach has been used in various research areas because of its efficiency at avoiding arbitrary interpretation with relatively little effort (Fraedrich and Ferrell, 1992; Fritzsche and Becker, 1983; Longenecker et al., 2006; Weibel, Rost, and Osterloh, 2010).

[2] Following Institutional Review Board (IRB) protocol, we did not actually keep the information.

(a) Treatment 1 (EYE)

(b) Treatment 2 (NAME)

Please write down your name. (First name only)

John Doe

Dear John Doe,
We appreciate you taking the time to complete this survey.
We are interested in the type of milk you like to buy. In what follows, we will ask you 8 different choice questions, and in each question we would like to know which type of milk you most prefer to purchase when grocery shopping.

Do you currently reside in OK?

Yes No

Do you currently reside in Stillwater?

Yes No

(c) Treatment 3 (FRND)

Now, imagine that you are in the specific situation described below.

Your good friends have family visiting. They've asked you to help out by taking their sibling, whom you've never met, to the grocery store. While you're there with your friend's sibling, you also need to do some shopping for yourself.

Figure 1. Three Treatments for Inducing Social Pressure Effects

Source: (Figure 1c) Photograph purchased from visualphotos.com.

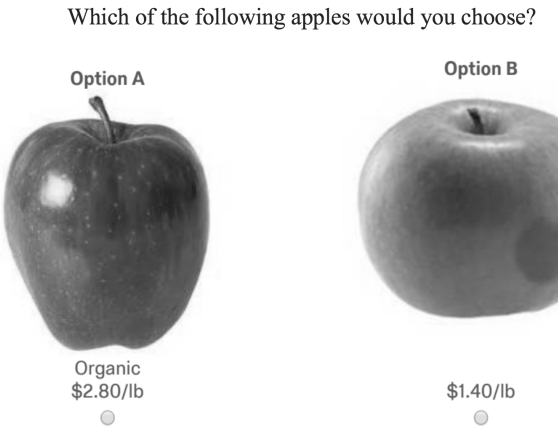

Figure 2. Example Question from Apple Choice Experiment

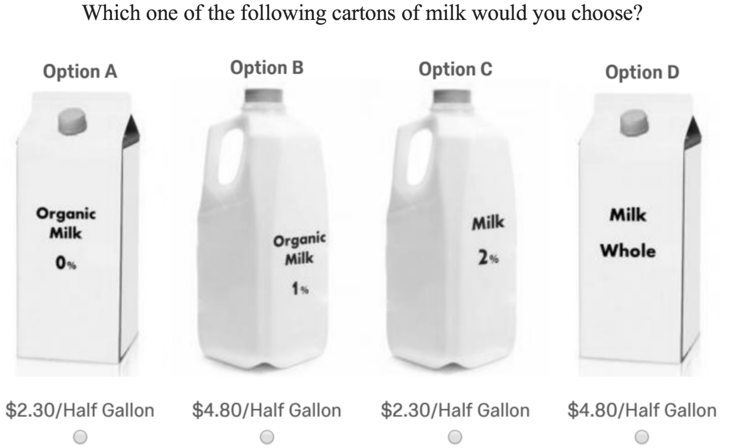

Figure 3. Example Question from Milk Choice Experiment

Questionnaire Design

We used the CE method to determine how the treatments affect consumer demand for organic food. CE is a type of conjoint analysis frequently used in environmental, marketing, and transportation literature to predict consumer choice by determining the relative importance of various attributes in consumers' choice processes (Louviere, Hensher, and Swait, 2000; Yonezawa and Richards, 2016). In our survey, consumers were asked to choose between two apples or among four milk alternatives, each described by three quality variables and one monetary variable. Respondents answered a set of eight questions for each product. The apple choice experiment was like that used in Costanigro and Lusk (2014), except we replaced the attribute associated with GMO labeling with one associated with organic labeling. For apples, the eight questions varied i) the prices ($1.40/lb vs. $2.80/lb), ii) the presence or absence of an organic label, iii) the presence or absence of a bruise, and iv) the color of the apples (red or green). For milk, the eight questions were constructed by varying i) the prices ($2.30/half gallon or $4.80/half gallon), ii) the presence or absence of an organic label, iii) the packaging (cardboard or plastic), and iv) the fat content (skim/1%/2%/whole). Thus, in one CE, consumers made choices between two apples and, in the other, consumers chose among four types of milk with varying levels of attributes. Table 1 summarizes the attributes and levels.

Table 1. Apple and Milk Attributes and Attribute Levels in the Choice Experiment Survey

Objective	Attribute	Attribute Levels
Apple	Price	$1.40/lb
		$2.80/lb
	Organic	Yes
		No
	Bruise	Yes
		No
	Color	Red
		Green
Milk	Price	$2.30/half gallon
		$4.80/half gallon
	Organic	Yes
		No
	Package	Cardboard
		Plastic
	Fat content	Fat free
		1%
		2%
		Whole milk

Given the four attributes and their varying levels, a large number of unique descriptions could be constructed.[3] To reduce the number of survey questions while maximizing the statistical performance of coefficient estimates, we applied a computer-generated design that maximizes a D-efficiency criterion (Kuhfeld, Tobias, and Garratt, 1994). The final designs for both apples and milk each included eight choice sets and had a D-efficiency score of 100, which is the efficiency of a perfectly balanced orthogonal design. Figures 2 and 3 show example questions for apples and milk CEs, respectively. The CE questions were identical across the three treatments and the control, with the order of questions varying randomly across respondents.

Model Specification and Estimation

Standard Multinomial Logit Model

In the survey, the ith respondent is faced with eight discrete choices between two apples and among four milk alternatives described by a set of attributes. As shown by Adamowicz et al. (1998), a random utility function may be defined by a deterministic (V_{ij}) and a stochastic (ε_{ij}) component:

(1) $$U_{ij} = V_{ij} + \varepsilon_{ij},$$

where U_{ij} is the ith consumer's utility of choosing option j, V_{ij} is the systematic portion of the utility function determined by the attributes of target goods and their values for alternative j, and ε_{ij} is a stochastic element. Assuming V_{ij} is linear in the parameters, the functional form of the systematic

[3] Specifically, 256 potential experimental treatments for apple and 1,024 for milk.

portion of the utility function can be expressed as

$$(2) \qquad V_{ij} = \boldsymbol{x}'_{ij}\boldsymbol{\beta},$$

where $\boldsymbol{x}_{ij}$ is the vector of attribute values for alternative j for consumer i and $\boldsymbol{\beta}$ represents the coefficient vector to be estimated. The probability that a consumer chooses alternative j is

$$(3) \qquad \text{Prob}(V_{ij} + \varepsilon_{ij} \geq V_{ik} + \varepsilon_{ik} \text{ for all } k \in C_i),$$

where C_i is the choice set for respondent i (i.e., $C_i =$ (A, B) for apples and $C_i =$ (A, B, C, D) for milk). If the random errors in equation (1) are independently and identically distributed across the j alternatives and N individuals with an extreme value distribution, Ben-Akiva and Lerman (1985) showed that the probability of consumer i choosing alternative j equals

$$(4) \qquad \text{Prob}(j \text{ is chosen}) = \frac{e^{\mu_i V_{ij}}}{\sum_{k \in C} e^{\mu_i V_{ij}}},$$

where μ_i is a scale parameter that is inversely related to the variance of the error term. In the multinomial logit model (MNL), the scale parameter, μ_i, is typically assumed to be equal to 1 because it is unidentifiable within any particular dataset. However, one can estimate the relative scale parameter across datasets (Swait and Louviere, 1993). Identifying the scale parameter is important in this application because our primary interest is determining whether consumers' preferences for each treatment are equivalent. Without accounting for the scale factor, one cannot be certain whether differences in parameter estimates are a result of differences in scale or differences in true underlying preferences. In this paper, the test procedure for scaling parameter follows Louviere, Hensher, and Swait (2000, p. 364), which is a straightforward adaptation of the Swait and Louviere (1993) test. The scale value for CTRL is fixed to equal 1 to calculate the relative scale parameter for each treated group.

Random Parameter Logit Model in WTP Space

To estimate the difference in apple and milk attribute effects among differently treated groups while accounting for heterogeneity in preferences, we used a random parameter logit (RPL) model in the WTP space. Train and Weeks (2005) suggested estimating WTP directly by reformulating the conventional model in such a way that the estimated parameters represent the parameters of the WTP distribution rather than marginal utilities. At first, to derive the model in WTP space, equation (2) is separated into monetary and nonmonetary attributes and then the equation by the scale parameter, μ_i in equation (4):

$$(5) \qquad V_{ij}/\mu_i = -(\alpha/\mu_i)P_{ij} + \boldsymbol{x}^{*\prime}_{ij}(\boldsymbol{\beta}/\mu_i),$$

where α is the coefficient of monetary attribute, P_{ij}, and $\boldsymbol{\beta}$ is the coefficient vector of nonmonetary attributes, $\boldsymbol{x}^*_{ij}$. The utility coefficients are defined as $\lambda = \alpha/\mu_i$ and $\boldsymbol{c} = \boldsymbol{\beta}/\mu_i$, such that the adjusted deterministic portion of utility, $K_{ij} = V_{ij}/\mu_i$, is written

$$(6) \qquad K_{ij} = -\lambda P_{ij} + \boldsymbol{x}^{*\prime}_{ij}\boldsymbol{c}.$$

With the redefined systematic portion of the utility function, K_{ij} in equation (6), the utility, U_{ij}, keeps the same behavior with a new error term that has the same variance for all respondents, and it is called utility in preference space (Train and Weeks, 2005).

The implied WTP is the ratio of the attribute's coefficient to the price coefficient: $\boldsymbol{w} = \boldsymbol{c}/\lambda = \boldsymbol{\beta}/\alpha$. Using this definition, equation (6) can be rewritten as

$$(7) \qquad K_{ij} = -\lambda(P_{ij} + \boldsymbol{x}^{*\prime}_{ij}\boldsymbol{w}),$$

and the utility, U_{ij}, is called utility in WTP space (Train and Weeks, 2005). The scale parameter is included in the price coefficient, λ, but it cancels out in the expression for the WTP coefficients. In equation (7), WTP is directly estimated as a parameter vector, $\boldsymbol{w}$.

Next, to account for heterogeneity in preferences, which are unrelated to observed characteristics (McFadden and Train, 2000), the model can be shown by redefining equation (7) as

$$K_{ij} = -\lambda[P_{ij} + \boldsymbol{x}_{ij}^{*'}(\bar{\boldsymbol{w}} + \boldsymbol{\sigma}\boldsymbol{u}_i)], \tag{8}$$

where $\bar{\boldsymbol{w}}$ is the population mean, σ is Cholesky decomposition, and $\boldsymbol{u}_i$ is a vector of independent standard normal deviates. In this model, an individual's preference for attributes may deviate from the population mean. Following Hole and Kolstad (2012), Layton and Brown (2000), and Revelt1998, the price coefficient, λ, is fixed and the distributions of WTP for all nonmonetary attributes are assumed to be independently normally distributed with mean $\bar{w}$ and standard deviation s_n.

The next step is to parameterize the covariance matrix. It is challenging to identify 15 covariance parameters for the full specification of the covariance matrix for milk. The independence assumption among attributes seems reasonable for some attributes, but it is unrealistic for fat content levels of milk. Therefore, no correlation among random parameters is assumed except the correlation among the fat content levels in the milk model. The lower triangular Cholesky factors for apples and milk to impose the hypothesized correlation are

$$\boldsymbol{\sigma}_{apple} = \begin{bmatrix} S_{organic} & & \\ 0 & S_{bruise} & \\ 0 & 0 & S_{color} \end{bmatrix}, \tag{9}$$

$$\boldsymbol{\sigma}_{milk} = \begin{bmatrix} S_{organic} & & & & \\ 0 & S_{package} & & & \\ 0 & 0 & S_{1\%} & & \\ 0 & 0 & S_{1\%,\,2\%} & S_{2\%} & \\ 0 & 0 & S_{1\%,\,whole} & S_{2\%,\,whole} & S_{whole} \end{bmatrix}. \tag{10}$$

The null hypothesis of no social pressure effect on organic food consumption is that the estimates, such as λ and $\boldsymbol{w}$, for each treated group will be the same as those in CTRL. Before testing the null hypothesis, data are multiplied by the relative scale parameters of each treatment to account for the difference in variance.

Testing for Treatment Effects

We test the null hypothesis that the estimate from a treatment is not bigger/smaller than that from another treatment using the combinatorial resampling approach described in Poe, Giraud, and Loomis (2005), which utilizes bootstrapped values from RPL models. Formally, the differences in parameter estimates from two different treatments are calculated for all possible combinations of the bootstrapped values as

$$D_{H_l},A_m = \beta_{H_l} - \beta_{A_m},\; l,\; m = 1, \ldots, 1{,}000, \tag{11}$$

Table 2. Summary Statistics and Variable Definitions for Control and Treated Groups

		Mean			
Variable	**Definition**	**CTRL**	**EYE**	**NAME**	**FRND**
Gender	1 = female; 0 = male	0.636	0.657	0.643	0.682
		(0.481)	(0.475)	(0.479)	(0.466)
Age	Age in years	51.138	52.530	50.577	51.360
		(12.966)	(13.252)	(12.727)	(13.679)
Child	Average number of children in household	0.435	0.442	0.472	0.393
		(0.865)	(0.897)	(0.924)	(0.826)
Education	1 = bachelor's degree or higher; 0 = no bachelor's degree	0.515	0.558	0.583	0.490
		(0.500)	(0.497)	(0.493)	(0.500)
Income	Household income level ($1,000)	78.117	77.747	74.064	77.238
		(42.883)	(38.574)	(38.850)	(42.928)
No. of obs.		239	233	235	239

Notes: Numbers in parentheses are standard deviations.

where β_{H_l} and β_{A_m} indicate the lth and mth bootstrapped values from two different treatments, H and A, respectively. From the previous procedure, 1,000,000 pairs are generated, and the proportion of the negative value of D_{H_l}, A_m is the p-value associated with the one-sided test for the null hypothesis that β_{H_l} is bigger/smaller than β_{A_m}.

Data

Data were collected from an online questionnaire. Participants were recruited by the online survey software provider Qualtrics and their associated partners. Respondents were randomly assigned to one of four groups, associated with the control and the three treatments. In total, 946 subjects participated in the study, with 239 randomly assigned to CTRL, 233 to EYE, 235 to NAME, and 239 to FRND. Table 2 reports summary statistics for the sample. In general, more women responded than men since we requested responses from only individuals who had purchased organic food and women are more often responsible for doing the household food shopping. The average participant age is about 51 years in CTRL, NAME and FRND, and 53 in EYE. The average number of children in each household is about 0.44 in CTRL and EYE, 0.47 in NAME, and 0.40 in FRND. About half of respondents had attained a bachelor's degree. The average annual household income is around $77,000–$78,000 in CTRL, EYE, and FRND, and around $74,000 in NAME. No significant differences across the groups with respect to these demographic variables are evident.[4]

Before presenting the model results, it is instructive to look at the raw summary statistics associated with the choice experiment. Every CE question involves a choice between an organic and nonorganic option, and, as such, one crude measure relates to the percentage of respondents choosing the organic option in each treatment (Table 3). The percentages are 56.5%, 58.0%, 58.6%, and 61.1% for apples and 59.2%, 61.0%, 59.8%, and 64.4% for milk in CTRL, EYE, NAME, and FRND, respectively.

[4] The respondents in this study are relatively older with few children, higher education, and high income. This might be because we requested responses only from individuals who had purchased organic food. The main point of our present inquiry is whether the treatments are similar to the control in terms of the demographic characteristics. The results in Table 2 prove the point.

Table 3. Percentage of Choosing Organic Option by Treatment

Objective	Treatment			
	CTRL	EYE	NAME	FRND
Apple	56.5%	58.0%	58.6%	61.1%
	(0.496)	(0.494)	(0.493)	(0.488)
Milk	59.2%	61.0%	59.8%	64.4%
	(0.492)	(0.488)	(0.490)	(0.479)
No. of obs.	239	233	235	239

Notes: Numbers in parentheses are standard deviations.

Results

As an initial step in the analysis, we tested whether the preference parameters was identical across the control and treated groups, following Louviere, Hensher, and Swait (2000) in a straightforward adaptation of the Swait and Louviere (1993) test. The null hypothesis is $\boldsymbol{\beta}_{CTRL} = \boldsymbol{\beta}_{EYE} = \boldsymbol{\beta}_{NAME} = \boldsymbol{\beta}_{FRND}$, where $\boldsymbol{\beta}_m$, $m = CTRL,\ EYE,\ NAME$, and $FRND$, are the parameter vectors for each treatment from MNL. First, we estimated log-likelihood values (LL_m) for each treatment. Estimates for apples are CTRL $-1{,}096.15$, EYE $-1{,}006.2$, NAME $-1{,}093.45$, and FRND $-1{,}057.8$ and for milk are CTRL $-2{,}245.3$, EYE $-2{,}108.5$, NAME $-2{,}255.0$, and FRND $-2{,}236.2$. Next, we pooled the data and estimated a joint model that imposed parameter equality but allowed for differences in scale. The log-likelihoods of these joint models (LL_j) are $-4{,}268.9$ for apples and $-8{,}845.0$ for milk. The test statistic is $-2(LL_J - \sum LL_m)$, which is distributed χ^2 with $K(M-1)$ degrees of freedom, where K is the number of restrictions and M is the number of treatments. We strongly reject the null of parameter equality across groups $(p < 0.01)$ for both apple and milk CEs, and the rejection is not simply a result of differences in variance. The scale parameters are estimated to be 1.000, 1.196, 1.013, and 1.073 for apples and 1.000, 1.125, 0.977, and 0.967 for milk for CTRL, EYE, NAME, and FRND, respectively. Smaller values of scale parameters relative to those for CTRL indicate a larger error variance, and vice versa. To account for the difference in variance, data for each treatment are multiplied by the relative scale parameters. After adjusting for differences in scale, it is possible to directly compare coefficient vectors for each treatment.

To account for preference heterogeneity, we estimated an RPL model in WTP space. With the RPL (Tables 4 and 5), the estimated standard deviation of the random parameters is statistically significant at the 1% level for apples and milk, except for the package attribute in CTRL with milk, indicating respondents have heterogeneous preferences for all nonmonetary attributes. Having heterogeneous tastes implies the RPL model is more suitable to estimate consumer preference than the conventional MNL, which assumes homogeneous preferences.[5]

In Table 4, the WTP premium for organic in FRND is higher by \$0.435 (88.2%) than that in the CTRL scenario (\$0.493);[6] this difference is statistically significant at the 1% level. Even though the organic WTPs are higher in EYE (23.0%) and NAME (29.8%) than in CTRL, there is no statistically significant difference at the 5% level. So being watched by a stranger (EYE and NAME) increases WTP for organic apples by about 20%–30% and being watched by an acquaintance (FRND) increases it by about 90%. NAME indicates a slightly higher price coefficient than others, and the price coefficient does not differ between CTRL and treated groups at the 5% level. For the bruise attribute, significant disfavor occurs in every group at the 1% level, with no difference across groups. For color attributes, only EYE and NAME show a preference for red apples at the 10% level.

[5] To compare the MNL and RPL, we also conducted likelihood ratio tests. The results show that RPL is more suitable than MNL at the 1% significance level, consistent with the results from AICC and BIC.

[6] The organic premiums for apple in CTRL are not different from those in other studies at the 5% level (Costanigro et al., 2011; Lin, Smith, and Huang, 2008).

Table 4. Estimates of Random Parameter Logit Model for Apple Segmented by Treatment in Willingness-to-Pay Space

			CTRL	EYE		NAME		FRND	
Attribute	**Variable**		**RPL**	**RPL**	***p*-Value**	**RPL**	***p*-Value**	**RPL**	***p*-Value**
Price	Apple price/lb	Fixed coeff.	−1.807***	−1.843***	0.568	−2.054***	0.849	−1.856***	0.584
			(0.146)	(0.163)		(0.186)		(0.169)	
Organic	Yes	Mean WTP	0.493***	0.606***	0.168	0.640***	0.122	0.928***	0.001
			(0.086)	(0.086)		(0.095)		(0.115)	
		$S_{organic}$	1.029***	1.029***		1.201***		1.446***	
			(0.175)	(0.172)		(0.190)		(0.239)	
Bruise	Yes	Mean WTP	−0.843***	−1.110***	0.966	−0.799***	0.365	−0.944***	0.765
			(0.096)	(0.118)		(0.093)		(0.106)	
		S_{bruise}	1.165***	1.507***		1.139***		1.276***	
			(0.195)	(0.235)		(0.184)		(0.218)	
Color	Red	Mean WTP	−0.063	0.289***	0.016	0.241*	0.042	0.160	0.104
			(0.129)	(0.104)		(0.123)		(0.132)	
		S_{color}	1.833***	1.367***		1.692***		1.900***	
			(0.272)	(0.210)		(0.250)		(0.302)	
No. of obs.			239	233		235		239	
AICC			1,821.9	1,676.7		1,740.7		1,789.9	

Notes: The null hypothesis is $\boldsymbol{\beta}_{CTRL} = \boldsymbol{\beta}_i$, i=EYE, NAME, FRND; it is calculated using the method described in Poe, Giraud, and Loomis (2005). Numbers in parentheses are standard errors. Single, double, and triple asterisks (*, **, ***) indicate statistical significance at the 10%, 5%, and 1% level, respectively. Organic, bruise, and color attributes are effects coded.

Table 5. Estimates of Random Parameter Logit Model for Milk Segmented by Treatment in Willingness-to-Pay Space

			CTRL	EYE		NAME		FRND	
Attribute	**Variable**		**RPL**	**RPL**	***p*-Value**	**RPL**	***p*-Value**	**RPL**	***p*-Value**
Price	Milk price/half gallon	Fixed coeff.	−1.266***	−1.214***	0.264	−1.015***	0.002	−1.099***	0.025
			(0.065)	(0.064)		(0.050)		(0.059)	
Organic	Yes	Mean WTP	0.816***	0.990***	0.248	0.960***	0.366	1.531***	0.007
			(0.228)	(0.157)		(0.171)		(0.203)	
		$S_{organic}$	1.835***	1.802***		2.178***		2.207***	
			(0.256)	(0.231)		(0.335)		(0.308)	
Package	Cardboard	Mean WTP	−0.032	−0.098	0.715	−0.069	0.629	−0.141	0.796
			(0.078)	(0.082)		(0.098)		(0.114)	
		$S_{package}$	0.417	0.628***		0.793***		1.072***	
			(0.284)	(0.209)		(0.258)		(0.248)	
Fat content	1%	Mean WTP	1.882***	1.498***	0.885	1.252***	1.000	1.411***	0.903
			(0.222)	(0.233)		(0.279)		(0.304)	
		$S_{1\%}$	2.521***	2.378***		3.031***		2.958***	
			(0.329)	(0.296)		(0.546)		(0.417	
		$S_{1\%,\ 2\%}$	3.350***	2.632***		3.491***		3.698***	
			(1.095)	(0.808)		(1.990)		(1.422)	
		$S_{1\%,\ whole}$	4.517***	2.729***		2.207***		3.041***	
			(1.397)	(0.898)		(2.244)		(1.460)	
	2%	Mean WTP	2.261***	1.662***	0.954	1.807***	0.999	1.977***	0.763
			(0.249)	(0.257)		(0.329)		(0.335)	
		$S_{2\%}$	2.333***	1.831***		2.117***		1.957***	
			(0.291)	(0.223)		(0.361)		(0.251)	
		$S_{2\%,\ whole}$	−0.199***	2.700***		3.867***		0.553***	
			(2.522)	(1.445)		(3.090)		(2.017)	
	Whole	Mean WTP	1.020***	−0.149	0.997	−0.155***	1.000	−1.087**	1.000
			(0.281)	(0.314)		(0.436)		(0.424)	
		S_{whole}	4.107***	3.377***		2.810***		3.823***	
			(0.771)	(0.396)		(0.483)		(0.479)	
No. of obs.			239	233		235		239	
AICC			3,045.2	2,976.4		3,275.7		3,113.7	

Notes: The null hypothesis is $\boldsymbol{\beta}_{CTRL} = \boldsymbol{\beta}_i$, i=EYE, NAME, FRND; it is calculated using the method described in Poe, Giraud, and Loomis (2005). Numbers in parentheses are standard errors. Single, double, and triple asterisks (*, **, ***) indicate statistical significance at the 10%, 5%, and 1% level, respectively. Organic, package, and fat content attributes are effects coded.

Table 5 shows the estimates of the RPL model in WTP space for milk segmented by treatment. For the organic attribute, FRND has the highest WTP premium ($0.816 higher than CTRL), significant at the 1% level.[7] EYE (21.3% higher) and NAME (17.6% higher) also show higher WTP premiums than CTRL, but these are not statistically significant at the 5% level. No preference is shown between cardboard and plastic packaging in all groups. The most preferred fat content is 2% in all groups. In CTRL, whole milk is preferred to skim, but in NAME and FRND, skim milk has a higher WTP than whole milk. There is no WTP difference for fat content level between CTRL and treated groups at the 5% level.

Based on the results, a social pressure effect does exist to purchase organic food, at least for apples and milk, and people demonstrate more social pressure when being watched by an acquaintance than by a stranger. As a next step, we attempt to determine the source of the effect. Education[8] is chosen as a candidate factor to increase social pressure based on research indicating a positive relationship between education level and organic food consumption (Andorfer and Liebe, 2013; Lockie et al., 2002; Schifferstein and Ophuis, 1998; Wier et al., 2008). Tables 6 and 7 present estimates segmented by treatment and education level.

For the organic apples (see Table 6), in both CTRL and FRND, WTP does not depend on education levels. The WTP for organic among less educated respondents in EYE and NAME are not different from CTRL, but among the more educated group, WTP for organic in EYE is higher than that of CTRL, at the 5% level. Based on the results, respondents significantly increase WTP for organic attributes while being watched by an acquaintance, regardless of education level. However, when they are exposed to a stranger, only the more educated group was conscious of the stranger, as shown by the increased WTP.

For milk (Table 7), the less educated groups in all treatments are indifferent to whether milk is organic. However, respondents with a bachelor's degree in EYE and FRND show a significantly higher WTP for organic. Even though the more educated group in NAME shows a higher mean WTP than that of CTRL, the difference is not significant at the 5% level. More educated groups in EYE and FRND indicate 160.4% and 47.4% higher WTP than less educated groups. However, the WTP difference for organic between more/less educated groups in NAME is not significant at the 5% level, even though the more educated group has a higher mean WTP (18.4%). The results with milk are consistent with that of apples: Education is an important moderator of social pressure on purchasing organic milk, and being exposed to an acquaintance makes the respondent pay the highest WTP for organic attributes, regardless of education level. While being watched by a stranger, the education effect on social pressure differs depending on whether the respondents' identification is exposed actively (NAME) or passively (EYE), even though both treatments expose respondents to a stranger.

In EYE, respondents with a bachelor's degree had significantly higher WTP for organic with both apples and milk compared to respondents without a degree, as much as 200.3% and 164.0%, but in NAME the percentages are only 30.2% and 18.4% (Figure 4). One possibility for the lower WTP in NAME compared to those in EYE is that respondents in NAME have an opportunity to deceive the experimenters by providing incorrect identification (first name), and thus NAME might not induce social pressure.

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[7] Few prior studies have estimated WTP for organic milk. Bernard and Bernard (2009) report a mean bid of $1.60 for a half-gallon of conventional milk and $1.93 for organic in an experimental auction, a $0.66/gallon premium for organic. Using scanner data and survey choice experiments, Brooks and Lusk (2010) find a mean WTP of $1.51/gallon for organic over conventional milk. Kiesel and Villas-Boas (2007) report WTP premiums between $1.46/gallon and $2.16/gallon for organic milk. Our estimates appear reasonable compared to these prior findings.

[8] Income is an alternative moderating factor (Ferrier and Zhen, 2017). Income has a similar, but less definitive, effect to education.

Table 6. Estimates of Random Parameter Logit Model for Apple Segmented by Treatment and Education in Willingness-to-Pay Space

			CTRL			EYE				
Attribute	**Variable**		**Low E**	**High E**	***p*-Value[a]**	**Low E**	***p*-Value[b]**	**High E**	***p*-Value[b]**	***p*-Value[a]**
Price	Apple price/lb	Fixed coeff.	−1.507***	−2.230***	0.012	−2.049***	0.041	−1.622***	0.967	0.107
			(0.158)	(0.276)		(0.278)		(0.183)		
Organic	Yes	WTP	0.479***	0.507***	0.451	0.298***	0.133	0.895***	0.020	0.000
			(0.125)	(0.118)		(0.092)		(0.144)		
		$S_{organic}$	1.020***	1.015***		0.608***		1.319***		
			(0.261)	(0.228)		(0.188)		(0.290)		
Bruise	Yes	Mean WTP	−0.837***	−0.846***	0.479	−1.244***	0.046	−1.004***	0.222	0.155
			(0.139)	(0.131)		(0.185)		(0.149)		
		S_{bruise}	1.166***	1.136***		1.581***		1.378***		
			(0.284)	(0.258)		(0.362)		(0.300)		
Color	Red	Mean WTP	0.135	−0.264	0.063	0.171	0.449	0.395***	0.003	0.129
			(0.167)	(0.197)		(0.155)		(0.140)		
		S_{color}	1.572***	2.002***		1.353***		1.342***		
			(0.341)	(0.398)		(0.300)		(0.283)		
No. of obs.			116	123		103		130		

			NAME					FRND				
Attribute	**Variable**		**Low E**	***p*-Value[b]**	**High E**	***p*-Value[b]**	***p*-Value[a]**	**Low E**	***p*-Value[b]**	**High E**	***p*-Value[b]**	***p*-Value[a]**
Price	Apple price/lb	Fixed coeff.	−2.435***	0.988	−1.793***	0.093	0.054	−1.622***	0.310	−1.989***	0.246	0.124
			(0.364)		(0.194)			(0.191)		(0.253)		
Organic	Yes	Mean WTP	0.539***	0.624	0.702***	0.135	0.204	0.913***	0.022	0.946***	0.017	0.438
			(0.138)		(0.128)			(0.167)		(0.158)		
		$S_{organic}$	1.118***		1.229***			1.449***		1.407***		
			(0.272)		(0.253)			(0.346)		(0.320)		
Bruise	Yes	Mean WTP	−0.947***	0.315	−0.705***	0.195	0.124	−0.918***	0.344	−0.972***	0.271	0.394
			(0.169)		(0.106)			(0.150)		(0.148)		
		S_{bruise}	1.396***		0.922***			1.233***		1.273***		
			(0.331)		(0.213)			(0.309)		(0.291)		
Color	Red	Mean WTP	0.619***	0.024	−0.013	0.153	0.005	0.386*	0.181	−0.004	0.151	0.086
			(0.183)		(0.159)			(0.225)		(0.160)		
		S_{color}	1.584***		1.679***			2.232***		1.500***		
			(0.364)		(0.322)			(0.480)		(0.321)		
No. of obs.			98		137			122		117		

Notes: Numbers in parentheses are standard errors. Single, double, and triple asterisks (*, **, ***) indicate statistical significance at the 10%, 5%, and 1% level, respectively. Organic, bruise, and color attributes are effects coded.

[a]The null hypothesis is $\beta_{Lower\ E,j} = \beta_{Higher\ E,j}$, where j indicates each attribute within a treatment group; it is calculated using the method described in Poe, Giraud, and Loomis (2005).

[b]The null hypothesis is $\beta_{l,CTRL,j} = \beta_{l,\ i,j}$, where l indicates the education level, i=EYE, NAME, FRND, and j denotes each attribute; it is calculated using the method described in Poe, Giraud, and Loomis (2005).

Table 7. Estimates of Random Parameter Logit Model for Milk Segmented by Treatment and Education in Willingness-to-Pay Space

			CTRL			EYE				
Attribute	**Variable**		**Low E**	**High E**	***p*-Value**[a]	**Low E**	***p*-Value**[b]	**High E**	***p*-Value**[b]	***p*-Value**[a]
Price	Milk price/half gallon	Fixed coeff.	−1.355***	−1.208***	0.143	−1.223***	0.171	−1.144***	0.301	0.260
			(0.102)	(0.088)		(0.094)		(0.081)		
Organic	Yes	Mean WTP	0.935***	0.872***	0.436	0.533***	0.133	1.407***	0.039	0.001
			(0.308)	(0.207)		(0.182)		(0.234)		
		$S_{organic}$	1.977***	1.876***		1.526***		2.276***		
			(0.354)	(0.404)		(0.346)		(0.463)		
Package	Cardboard	Mean WTP	−0.110	−0.010	0.264	−0.231**	0.188	0.044	0.371	0.033
			(0.098)	(0.122)		(0.106)		(0.110)		
		$S_{package}$	0.000	0.656**		0.447		0.520		
			.	(0.326)		(0.352)		(0.329)		
Fat Content	1%	Mean WTP	1.751***	1.294***	0.232	1.187***	0.157	2.038***	0.077	0.047
			(0.454)	(0.386)		(0.327)		(0.388)		
		$S_{1\%}$	2.361***	2.966***		2.291***		3.165***		
			(0.699)	(0.770)		(0.611)		(0.766)		
		$S_{1\%,\ 2\%}$	2.990***	4.001***		2.413***		3.892***		
			(0.806)	(1.064)		(0.706)		(0.949)		
		$S_{1\%,\ whole}$	3.128***	3.196***		1.279		5.254***		
			(0.857)	(1.091)		(0.831)		(1.39)		
	2%	Mean WTP	2.205***	1.609***	0.221	1.566***	0.177	2.154***	0.217	0.158
			(0.605)	(0.485)		(0.380)		(0.455)		
		$S_{2\%}$	2.443***	1.775***		1.870***		1.588***		
			(0.503)	(0.435)		(0.455)		(0.369)		
		$S_{2\%,\ whole}$	−0.955***	1.692***		2.816***		3.112***		
			(0.372)	(0.501)		(0.875)		(0.714)		
	Whole	Mean WTP	0.931	0.156	0.188	0.056	0.617	−0.122	0.383	0.424
			(0.656)	(0.622)		(0.522)		(0.732)		
		S_{whole}	3.420***	4.046***		2.780***		2.977***		
			(0.695)	(0.987)		(0.713)		(0.647)		
No. of obs.			116	123		103		130		

Notes: Single, double, and triple asterisks (*, **, ***) indicate statistical significance at the 10%, 5%, and 1% level, respectively. Numbers in parentheses are standard errors. Organic, package, and fat content attributes are effects coded.

[a]The null hypothesis is $\beta_{Lower\ E,j} = \beta_{Higher\ E,j}$, where j indicates each attribute within a treatment group; it is calculated using the method described in Poe, Giraud, and Loomis (2005).

[b]The null hypothesis is $\beta_{l,CTRL,j} = \beta_{l,i,j}$, where l indicates the education level, i=EYE, NAME, FRND, and j denotes each attribute; it is calculated using the method described in Poe, Giraud, and Loomis (2005).

Table 7 (continued).

			NAME					FRND				
Attribute	**Variable**		**Low E**	***p*-Value**[b]	**High E**	***p*-Value**[b]	***p*-Value**[a]	**Low E**	***p*-Value**[b]	**High E**	***p*-Value**[b]	***p*-Value**[a]
Price	Milk price/half gallon	Fixed coeff.	−1.070***	0.018	−0.993***	0.023	0.233	−1.203***	0.140	−1.063***	0.107	0.138
			(0.085)		(0.063)			(0.099)		(0.080)		
Organic	Yes	Mean WTP	0.871***	0.440	1.031***	0.296	0.328	1.305***	0.182	1.923***	0.001	0.050
			(0.296)		(0.205)			(0.283)		(0.286)		
		$S_{organic}$	2.534***		1.918***			2.287***		2.518***		
			(0.584)		(0.405)			(0.451)		(0.574)		
Package	Cardboard	Mean WTP	−0.135	0.455	−0.018	0.492	0.275	−0.217	0.278	−0.097	0.346	0.289
			(0.132)		(0.140)			(0.149)		(0.162)		
		$S_{package}$	0.443		0.975***			0.964***		1.049***		
			(0.515)		(0.331)			(0.347)		(0.363)		
Fat Content	1%	Mean WTP	1.146**	0.174	1.242***	0.487	0.406	1.775***	0.485	1.319***	0.483	0.231
			(0.449)		(0.361)			(0.415)		(0.465)		
		$S_{1\%}$	3.099***		3.090***			2.963***		3.872***		
			(0.891)		(0.724)			(0.603)		(0.993)		
		$S_{1\%,\ 2\%}$	2.868***		3.815***			3.729***		4.915***		
			(0.919)		(0.900)			(0.741)		(1.257)		
		$S_{1\%,\ whole}$	0.456		3.213***			−0.010		6.062***		
			(0.991)		(1.023)			(0.500)		(1.566)		
	2%	Mean WTP	2.292***	0.443	1.419***	0.375	0.085	2.749***	0.255	1.668***	0.459	0.078
			(0.483)		(0.442)			(0.545)		(0.555)		
		$S_{2\%}$	2.311***		1.966***			2.084***		1.524***		
			(0.649)		(0.429)			(0.366)		(0.386)		
		$S_{2\%,\ whole}$	4.639***		3.017***			4.198***		1.440***		
			(1.589)		(0.724)			(0.882)		(0.357)		
	Whole	Mean WTP	−0.202	0.210	−0.415	0.247	0.248	−0.306	0.072	−1.459*	0.063	0.122
			(0.633)		(0.588)			(0.555)		(0.841)		
		S_{whole}	1.586***		3.214***			4.074***		3.537***		
			(0.426)		(0.714)			(0.867)		(0.848)		
No. of obs.			98		137			122		117		

Notes: Single, double, and triple asterisks (*, **, ***) indicate statistical significance at the 10%, 5%, and 1% level, respectively. Numbers in parentheses are standard errors. Organic, package, and fat content attributes are effects coded.

[a]The null hypothesis is $\beta_{Lower\ E,j} = \beta_{Higher\ E,j}$, where j indicates each attribute within a treatment group; it is calculated using the method described in Poe, Giraud, and Loomis (2005).

[b]The null hypothesis is $\beta_{l,CTRL,j} = \beta_{l,i,j}$, where l indicates the education level, i=EYE, NAME, FRND, and j denotes each attribute; it is calculated using the method described in Poe, Giraud, and Loomis (2005).

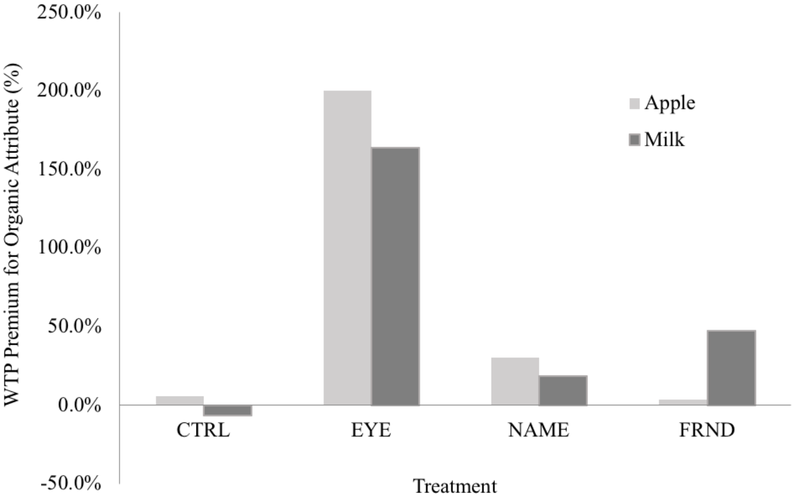

Figure 4. WTP Premium for Organic Attribute in More Educated Group Compared to Less Educated Group within Each Treatment

Conclusion

U.S. consumption of organic foods has been increasing. Past research has explained the increased demand for organic food as being due to health concerns, perceived taste, perceived environmental benefits, perceived benefits to small or local farmers, and improved animal welfare. In this paper, we consider social pressure as a possible additional factor. Social pressure to purchase organic food suggests that consumers purchase organic foods as a symbolic action to indicate their high social status to others.

We chose apples and milk as the study objects since they are representative of the two largest organic sales categories. Because no market-level data were available to test for a social pressure effect on purchasing organic apples or milk, we used a hypothetical choice experiment. To induce social pressure, we applied three treatments, all of which were based on similar treatments used in social psychology literature. The treatments are i) an eye image, ii) repeating the respondent's name, and iii) a vignette with an acquaintance. The choices made are hypothetical, and it is well known that hypothetical responses can differ substantially from actual responses. Future research may want to consider a field experiment in which an observer follows a consumer around a store as a way of verifying the effects found in the vignette.

The vignette with the acquaintance yields the highest WTP for the organic attributes for apples and milk. Even though the WTP differences for anonymous eyes and a reminder of one's identity are not significant at the 5% level, they did show higher WTP (20%–30%) relative to the control group. The results are moderated by education, with more educated respondents demonstrating social pressure effects.

These results provide suggestive, but far from conclusive, evidence that social pressure encourages purchasing organic foods. Those marketing organic food will want to promote and protect its social status. The implication for policy makers is that purchasers of organic food may want to resist efforts to promote organic food if its appeal is largely a way of demonstrating social status among those who already have it.

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References

Adamowicz, W., P. Boxall, M. Williams, and J. Louviere. "Stated Preference Approaches for Measuring Passive Use Values: Choice Experiments and Contingent Valuation." *American Journal of Agricultural Economics* 80(1998):64–75. doi: 10.2307/3180269.

Aertsens, J., W. Verbeke, K. Mondelaers, and G. Van Huylenbroeck. "Personal Determinants of Organic Food Consumption: A Review." *British Food Journal* 111(2009):1140–1167. doi: 10.1108/00070700910992961.

Akerlof, G. A., and R. E. Kranton. "Economics and Identity." *Quarterly Journal of Economics* 115(2000):715–753. doi: 10.1162/003355300554881.

Alexander, C. S., and H. J. Becker. "The Use of Vignettes in Survey Research." *Public Opinion Quarterly* 42(1978):93–104. doi: 10.1086/268432.

Allen, P., and M. Kovach. "The Capitalist Composition of Organic: The Potential of Markets in Fulfilling the Promise of Organic Agriculture." *Agriculture and Human Values* 17(2000):221–232. doi: 10.1023/A:1007640506965.

Andorfer, V. A., and U. Liebe. "Consumer Behavior in Moral Markets. On the Relevance of Identity, Justice Beliefs, Social Norms, Status, and Trust in Ethical Consumption." *European Sociological Review* 29(2013):1251–1265. doi: 10.1093/esr/jct014.

Arvola, A., M. Vassallo, M. Dean, P. Lampila, A. Saba, L. Lähteenmäki, and R. Shepherd. "Predicting Intentions to Purchase Organic Food: The Role of Affective and Moral Attitudes in the Theory of Planned Behaviour." *Appetite* 50(2008):443–454. doi: 10.1016/j.appet.2007.09.010.

Bateson, M., D. Nettle, and G. Roberts. "Cues of Being Watched Enhance Cooperation in a Real-World Setting." *Biology Letters* 2(2006):412–414. doi: 10.1098/rsbl.2006.0509.

Batley, S., D. Colbourne, P. Fleming, and P. Urwin. "Citizen versus Consumer: Challenges in the UK Green Power Market." *Energy Policy* 29(2001):479–487. doi: 10.1016/S0301-4215(00)00142-7.

Ben-Akiva, M., and S. R. Lerman. *Discrete Choice Analysis: Theory and Application to Travel Demand*. Cambridge, MA: MIT Press, 1985.

Bernard, J. C., and D. J. Bernard. "What Is It about Organic Milk? An Experimental Analysis." *American Journal of Agricultural Economics* 91(2009):826–836. doi: 10.1111/ j.1467-8276.2009.01258.x.

Bourdieu, P. *Distinction: A Social Critique of the Judgement of Taste*. Cambridge, MA: Harvard University Press, 1984.

Briggeman, B. C., and J. L. Lusk. "Preferences for Fairness and Equity in the Food System." *European Review of Agricultural Economics* 38(2011):1–29. doi: 10.1093/erae/jbq033.

Brooks, K., and J. L. Lusk. "Stated and Revealed Preferences for Organic and Cloned Milk: Combining Choice Experiment and Scanner Data." *American Journal of Agricultural Economics* 92(2010):1229–1241. doi: 10.1093/ajae/aaq054.

Burnham, T. C. "Engineering Altruism: a Theoretical and Experimental Investigation of Anonymity and Gift Giving." *Journal of Economic Behavior & Organization* 50(2003):133–144. doi: 10.1016/S0167-2681(02)00044-6.

Chang, J. B., and J. L. Lusk. "Fairness and Food Choice." *Food Policy* 34(2009):483–491. doi: 10.1016/j.foodpol.2009.08.002.

Chen, M.-F. "Attitude toward Organic Foods among Taiwanese as Related to Health Consciousness, Environmental Attitudes, and the Mediating Effects of a Healthy Lifestyle." *British Food Journal* 111(2009):165–178. doi: 10.1108/00070700910931986.

Conty, L., D. Gimmig, C. Belletier, N. George, and P. Huguet. "The Cost of Being Watched: Stroop Interference Increases under Concomitant Eye Contact." *Cognition* 115(2010):133–139. doi: 10.1016/:j.cognition.2009.12.005.

Costanigro, M., and J. L. Lusk. "The Signaling Effect of Mandatory Labels on Genetically Engineered Food." *Food Policy* 49(2014):259–267. doi: 10.1016/j.foodpol.2014.08.005.

Costanigro, M., D. T. McFadden, S. Kroll, and G. Nurse. "An In-Store Valuation of Local and Organic Apples: The Role of Social Desirability." *Agribusiness* 27(2011):465–477. doi: 10.1002/agr.20281.

Dastrup, S. R., J. Graff Zivin, D. L. Costa, and M. E. Kahn. "Understanding the Solar Home Price Premium: Electricity Generation and 'Green' Social Status." *European Economic Review* 56(2012):961–973. doi: 10.1016/j.euroecorev.2012.02.006.

DellaVigna, S., J. List, and U. Malmendier. "Testing for Altruism and Social Pressure in Charitable Giving." NBER Working Paper w15629, National Bureau of Economic Research, Cambridge, MA, 2009.

Ekström, M. "Do Watching Eyes Affect Charitable Giving? Evidence from a Field Experiment." *Experimental Economics* 15(2012):530–546. doi: 10.1007/s10683-011-9312-6.

Ernest-Jones, M., D. Nettle, and M. Bateson. "Effects of Eye Images on Everyday Cooperative Behavior: a Field Experiment." *Evolution and Human Behavior* 32(2011):172–178. doi: 10.1016/j.evolhumbehav.2010.10.006.

Ferrier, P. M., and C. Zhen. "The Role of Income in Explaining the Shift from Preserved to Fresh Vegetable Purchases." *Journal of Agricultural and Resource Economics* 42(2017):329–349.

Fisher, R. J. "Social Desirability Bias and the Validity of Indirect Questioning." *Journal of Consumer Research* 20(1993):303–315. doi: 10.1086/209351.

Fraedrich, J. P., and O. Ferrell. "The Impact of Perceived Risk and Moral Philosophy Type on Ethical Decision Making in Business Organizations." *Journal of Business Research* 24(1992):283–295. doi: 10.1016/0148-2963(92)90035-A.

Fritzsche, D. J., and H. Becker. "Ethical Behavior of Marketing Managers." *Journal of Business Ethics* 2(1983):291–299. doi: 10.1007/BF00383187.

Getzner, M. "Hypothetical and Real Economic Commitments, and Social Status, in Valuing a Species Protection Programme." *Journal of Environmental Planning and Management* 43(2000):541–559. doi: 10.1080/713676576.

Griskevicius, V., J. M. Tybur, and B. Van den Bergh. "Going Green to Be Seen: Status, Reputation, and Conspicuous Conservation." *Journal of Personality and Social Psychology* 98(2010):392–404. doi: 10.1037/a0017346.

Harper, G. C., and A. Makatouni. "Consumer Perception of Organic Food Production and Farm Animal Welfare." *British Food Journal* 104(2002):287–299. doi: 10.1108/00070700210425723.

Hidrue, M. K., G. R. Parsons, W. Kempton, and M. P. Gardner. "Willingness to Pay for Electric Vehicles and Their Attributes." *Resource and Energy Economics* 33(2011):686–705. doi: 10.1016/j.reseneeco.2011.02.002.

Hirsch, F. *Social Limits to Growth*. London, UK: Routledge, 1976.

Hjelmar, U. "Consumers' Purchase of Organic Food Products. A Matter of Convenience and Reflexive Practices." *Appetite* 56(2011):336–344. doi: 10.1016/j.appet.2010.12.019.

Hoffman, E., K. McCabe, and V. L. Smith. "Social Distance and Other-Regarding Behavior in Dictator Games." *American Economic Review* 86(1996):653–660. doi: 10.1257/aer.89.1.340.

Hole, A. R., and J. R. Kolstad. "Mixed Logit Estimation of Willingness to Pay Distributions: A Comparison of Models in Preference and WTP Space Using Data from a Health-Related Choice Experiment." *Empirical Economics* 42(2012):445–469. doi: 10.1007/s00181-011-0500-1.

Honkanen, P., B. Verplanken, and S. O. Olsen. "Ethical Values and Motives Driving Organic Food Choice." *Journal of Consumer Behaviour* 5(2006):420–430. doi: 10.1002/cb.190.

Kapteyn, A., J. Smith, and A. van Soest. "Vignettes and Self-Reports of Work Disability in the United States and the Netherlands." *American Economic Review* 97(2007):461–473. doi: 10.1257/000282807780323596.

Kiesel, K., and S. B. Villas-Boas. "Got Organic Milk? Consumer Valuations of Milk Labels after the Implementation of the USDA Organic Seal." *Journal of Agricultural & Food Industrial Organization* 5(2007):1–38. doi: 10.2202/1542-0485.1152.

Kim, Y. H., and J.-E. Chung. "Consumer Purchase Intention for Organic Personal Care Products." *Journal of Consumer Marketing* 28(2011):40–47. doi: 10.1108/07363761111101930.

Kuhfeld, W. F., R. D. Tobias, and M. Garratt. "Efficient Experimental Design with Marketing Research Applications." *Journal of Marketing Research* 31(1994):545–557. doi: 10.2307/3151882.

Layton, D. F., and G. Brown. "Heterogeneous Preferences Regarding Global Climate Change." *Review of Economics and Statistics* 82(2000):616–624. doi: 10.1162/003465300559091.

Lee, W.-C. J., M. Shimizu, K. M. Kniffin, and B. Wansink. "You Taste What You See: Do Organic Labels Bias Taste Perceptions?" *Food Quality and Preference* 29(2013):33–39. doi: 10.1016/j.foodqual.2013.01.010.

Lin, B.-H., T. A. Smith, and C. L. Huang. "Organic Premiums of US Fresh Produce." *Renewable Agriculture and Food Systems* 23(2008):208–216. doi: 10.1017/S1742170508002238.

Lockie, S., K. Lyons, G. Lawrence, and K. Mummery. "Eating 'Green': Motivations behind organic food consumption in Australia." *Sociologia Ruralis* 42(2002):23–40. doi: 10.1111/1467-9523.00200.

Longenecker, J. G., C. W. Moore, J. W. Petty, L. E. Palich, and J. A. McKinney. "Ethical Attitudes in Small Businesses and Large Corporations: Theory and Empirical Findings from a Tracking Study Spanning Three Decades." *Journal of Small Business Management* 44(2006):167–183. doi: 10.1111/j.1540-627X.2006.00162.x.

Louviere, J. J., D. A. Hensher, and J. D. Swait. *Stated Choice Methods: Analysis and Applications*. Cambridge, UK: Cambridge University Press, 2000.

Lusk, J. L. "External Validity of the Food Values Scale." *Food Quality and Preference* 22(2011):452–462. doi: 10.1016/j.foodqual.2011.02.009.

Lusk, J. L., and B. C. Briggeman. "Food Values." *American Journal of Agricultural Economics* 91(2009):184–196. doi: 10.1111/j.1467-8276.2008.01175.x.

Martha Stewart Living. "Fresh Thinking: How to Shop for Fruits and Vegetables - Whole Living Eat Well." 2010. Available online at http://www.wholeliving.com/134307/fresh-thinking-how-shop-fruits-and-vegetables.

McFadden, D., and K. Train. "Mixed MNL Models for Discrete Response." *Journal of Applied Econometrics* 15(2000):447–470. doi: 10.1002/1099-1255(200009/10)15:5<447::AID-JAE570>3.0.CO;2-1.

Meas, T., W. Hu, M. T. Batte, T. A. Woods, and S. Ernst. "Substitutes or Complements? Consumer Preference for Local and Organic Food Attributes." *American Journal of Agricultural Economics* 97(2015):1044–1071. doi: 10.1093/ajae/aau108.

Oprah.com. "Eat Organically." 2006. Available online at http://www.oprah.com/world/eat-organically.

Organic Trade Association. *State of the Organic Industry*. Washington, DC: Organic Trade Association, 2015. Available online at http://ota.com/sites/default/files/indexed_files/StateOfOrganicIndustry_0.pdf.

Panagopoulos, C. "Affect, Social Pressure and Prosocial Motivation: Field Experimental Evidence of the Mobilizing Effects of Pride, Shame and Publicizing Voting Behavior." *Political Behavior* 32(2010):369–386. doi: 10.1007/s11109-010-9114-0.

Pietrykowski, B. "You Are What You Eat: The Social Economy of the Slow Food Movement." *Review of Social Economy* 62(2004):307–321. doi: 10.1080/0034676042000253927.

Poe, G. L., K. L. Giraud, and J. B. Loomis. "Computational Methods for Measuring the Difference of Empirical Distributions." *American Journal of Agricultural Economics* 87(2005):353–365. doi: 10.1111/j.1467-8276.2005.00727.x.

Powell, K. L., G. Roberts, and D. Nettle. "Eye Images Increase Charitable Donations: Evidence From an Opportunistic Field Experiment in a Supermarket." *Ethology* 118(2012):1096–1101. doi: 10.1111/eth.12011.

Rimal, A. P., W. Moon, and S. Balasubramanian. "Agro-Biotechnology and Organic Food Purchase in the United Kingdom." *British Food Journal* 107(2005):84–97. doi: 10.1108/00070700510579162.

Ruiz de Maya, S., I. López-López, and J. L. Munuera. "Organic Food Consumption in Europe: International Segmentation Based on Value System Differences." *Ecological Economics* 70(2011):1767–1775. doi: 10.1016/j.ecolecon.2011.04.019.

Schifferstein, H. N., and P. A. O. Ophuis. "Health-Related Determinants of Organic Food Consumption in the Netherlands." *Food Quality and Preference* 9(1998):119–133. doi: 10.1016/S0950-3293(97)00044-X.

Schuldt, J., and N. Schwarz. "The 'Organic' Path to Obesity? Organic Claims Influence Calorie Judgments and Exercise Recommendations." *Judgment and Decision Making* 5(2010):144–150.

Sexton, S. E., and A. L. Sexton. "Conspicuous Conservation: The Prius Halo and Willingness to Pay for Environmental Bona Fides." *Journal of Environmental Economics and Management* 67(2014):303–317. doi: 10.1016/j.jeem.2013.11.004.

Swait, J., and J. Louviere. "The Role of the Scale Parameter in the Estimation and Comparison of Multinomial Logit Models." *Journal of Marketing Research* 30(1993):305–314. doi: 10.2307/3172883.

Train, K., and M. Weeks. "Discrete Choice Models in Preference Space and Willingness-to-Pay Space." In R. Scarpa and A. Alberini, eds., *Applications of Simulation Methods in Environmental and Resource Economics,* No. 6 in Economics of Non-Market Goods and Resources. Dordrecht, Netherlands: Springer, 2005, 1–16.

U.S. Department of Agriculture. *Organic Market Overview*. Washington, DC: U.S. Department of Agriculture, Economic Research Service, 2014a. Available online at http://www.ers.usda.gov/topics/natural-resources-environment/organic-agriculture/organic-market-overview.

———. *Organic Prices*. Washington, DC: U.S. Department of Agriculture, Economic Research Service, 2014b. Available online at http://www.ers.usda.gov/data-products/organic-prices.aspx.

Weibel, A., K. Rost, and M. Osterloh. "Pay for Performance in the Public Sector–Benefits and (Hidden) Costs." *Journal of Public Administration Research and Theory* 20(2010):387–412. doi: 10.1093/jopart/mup009.

Wier, M., K. O'Doherty Jensen, L. M. Andersen, and K. Millock. "The Character of Demand in Mature Organic Food Markets: Great Britain and Denmark Compared." *Food Policy* 33(2008):406–421. doi: 10.1016/j.foodpol.2008.01.002.

Yonezawa, K., and T. J. Richards. "Risk Aversion and Preference for Store Price Format." *Journal of Agricultural and Resource Economics* 41(2016):425–443.

Zagata, L. "Consumers' Beliefs and Behavioural Intentions towards Organic Food. Evidence from the Czech Republic." *Appetite* 59(2012):81–89. doi: 10.1016/j.appet.2012.03.023.

Żakowska Biemans, S. "Polish Consumer Food Choices and Beliefs about Organic Food." *British Food Journal* 113(2011):122–137. doi: 10.1108/00070701111097385.

Appendix

Table A1 reports the estimates of the MNL model in the WTP space for apples. The coefficient for the price attribute is negative as expected, and the CTRL scenario shows slightly more sensitivity to changes in price than the others. WTP for the organic attribute is lowest in CTRL, at $0.512, and is highest in FRND, at $0.955 (86.4%), a difference that is statistically significant at the 1% level. A higher WTP in the treatment groups than in the CTRL is consistent with the hypothesis of a social pressure effect. WTP for organic in EYE and NAME is higher than in CTRL by $0.107 (20.9%) and $0.148 (28.9%), respectively, but the differences are not significant at the 5% level. For all groups, the existence of a bruise has a negative impact on apple choice. For color, all treated groups preferred red to green at the 10% level.

Table A2 shows the estimates of the MNL milk model. The WTP for the organic attribute has the highest WTP in FRND, $1.421, and the difference (81.4% higher) from CTRL is significant at the 1% level. Like the results in Table A1, EYE and NAME do not show a significant difference from CTRL at the 5% level, even though they show a higher estimated mean WTP than CTRL as much as $0.857 (9.4%) and $0.864 (10.3%), respectively. For all groups, no preference for packaging material between cardboard and plastic is indicated. All fat content attributes indicate positive WTP, except for the attribute level "whole" in NAME and FRND. Of the four fat content levels, 2% milk is most preferred, and it has a WTP as much as $1 more than that for skim milk. The WTP for each fat content attribute level does not significantly differ between CTRL and the treatment groups at the 5% level.

Even though the estimates in Tables A1 and A2 are enlightening for comparing mean attribute levels across treatments, the MNL assumes that all respondents in the same treatment group have identical preferences.

Table A1. Estimates of Multinomial Logit (MNL) Model for Apple Segmented by Treatment Estimated in Willingness-to-Pay Space

			CTRL	EYE		NAME		FRND	
Attribute	**Variable**		**MNL**	**MNL**	***p*-Value**	**MNL**	***p*-Value**	**MNL**	***p*-Value**
Price	Apple price/lb	Fixed coeff.	−0.650***	−0.592***	0.121	−0.626***	0.323	−0.577***	0.081
			(0.038)	(0.035)		(0.037)		(0.038)	
Organic	Yes	Mean WTP	0.512***	0.619***	0.166	0.660***	0.101	0.955***	0.000
			(0.082)	(0.081)		(0.083)		(0.100)	
Bruise	Yes	Mean WTP	−0.859***	−1.091***	0.971	−0.825***	0.386	−0.980***	0.825
			(0.086)	(0.086)		(0.085)		(0.101)	
Color	Red	Mean WTP	−0.062	0.292***	0.001	0.253***	0.002	0.170*	0.022
			(0.080)	(0.078)		(0.079)		(0.089)	
No. of obs.			239	233		235		239	
AICC			2,200.3	2,020.5		2,123.6		2,194.9	
Scale parameter			1.000	1.196		1.073		1.013	

Notes: The null hypothesis is $\beta_{CTRL} = \beta_i$, i=EYE, NAME, FRND; it is calculated using the method described in Poe, Giraud, and Loomis (2005). Numbers in parentheses are standard errors. Single, double, and triple asterisks (*, **, ***) indicate statistical significance at the 10%, 5%, and 1% level, respectively. Organic, bruise, and color attributes are effects coded.

Table A2. Estimates of Multinomial Logit (MNL) Model for Milk Segmented by Treatment in Willingness-to-Pay Space

			CTRL	EYE		NAME		FRND	
Attribute	**Variable**		**MNL**	**MNL**	***p*-Value**	**MNL**	***p*-Value**	**MNL**	***p*-Value**
Price	Milk price/half gallon	Fixed coeff.	−0.510***	−0.518***	0.593	−0.509***	0.476	−0.458***	0.038
			(0.022)	(0.021)		(0.023)		(0.022)	
Organic	Yes	Mean WTP	0.784***	0.857***	0.285	0.864***	0.282	1.421***	0.000
			(0.103)	(0.092)		(0.106)		(0.128)	
Package	Cardboard	Mean WTP	0.107	−0.044	0.873	−0.025	0.833	−0.140	0.955
			(0.096)	(0.086)		(0.100)		(0.111)	
Fat content	1%	Mean WTP	0.550***	0.860***	0.055	0.607***	0.388	0.366**	0.797
			(0.152)	(0.134)		(0.152)		(0.166)	
	2%	Mean WTP	1.429***	1.036***	0.975	1.101***	0.942	1.332***	0.673
			(0.148)	(0.132)		(0.149)		(0.162)	
	Whole	Mean WTP	0.610***	0.236*	0.960	0.111	0.987	−0.176	1.000
			(0.155)	(0.142)		(0.160)		(0.177)	
No. of obs.			239	233		235		239	
AICC			4,502.6	4,229.0		4,484.5		4,522.0	
Scale parameter			1.000	1.126		0.967		0.978	

Notes: The null hypothesis is $\beta_{CTRL} = \beta_i$, i=EYE, NAME, FRND; it is calculated using the method described in Poe, Giraud, and Loomis (2005). Numbers in parentheses are standard errors. Single, double, and triple asterisks (*, **, ***) indicate statistical significance at the 10%, 5%, and 1% level, respectively. Organic, package, and fat content attributes are effects coded.