WORKING PAPERS IN ECONOMICS

No 286

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February 2008

ISSN 1403-2473 (print)
ISSN 1403-2465 (online)

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Conformity and the demand for environmental goods

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Abstract

We test the hypothesis that people conform to certain social norms, i.e. that some individuals may be willing to pay a higher price premium for green products the more widespread green consumerism is in society. To investigate consumer preferences for environmentally friendly products, we conducted a choice experiment where the respondents were asked to choose among coffee products varying with respect to their share of ecological beans, share of fair trade beans, and price. Three treatments were used, differing only in the information given about the choices made by other consumers. More specifically, the respondents in the three subgroups were told that 10%, 50%, and 90% of all other consumers chose the alternative with 100% ecological beans. We find different responses to the treatments across individuals. In particular, we can only confirm our hypothesis of conformity for women, although men appear to have stronger preferences for ecological coffee than women.

JEL Classification**:** C90; D12.

Keywords: Conformity, Choice Experiments, Environmental Goods.

Acknowledgements: Financial support from Sida to the Environmental Economics Unit at the University of Gothenburg as well as funding from Mistra's Climate Policy Research Program (CLIPORE) is gratefully acknowledged. The authors are indebted to Karin Jonsson and Anna Lock for research assistance. The paper has benefited from comments by Olof Johansson-Stenman, Katrin Millock, seminar participants at the University of Gothenburg, and participants at the Second Nordic Workshop in Behavioral and Experimental Economics, University of Gothenburg.

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1. Introduction

It is a well-established fact that many people are concerned with the environment when making consumption decisions (Carlsson et al., 2007; Teisl et al., 2002; Bjorner et al., 2004), although the degree of concern differs among individuals, goods, and environmental problems. There are many reasons why people have environmentally friendly preferences, ranging from purely self-interest motives such as health risk avoidance to ethical and altruistic concerns about biodiversity, climate, or animal welfare. The demand for environmentally friendly consumer goods has increased, in some instances rather dramatically, over the last 15 years. The market response to this has been an increased supply of environmentally friendly goods and the emergence of various eco-labeling (Sterner, 2003). Some of these schemes have been evaluated (e.g. Huang, 1996; Nimon and Beghin, 1999; Johnston et al., 2001; Blend and Ravenswaay, 1999; Teisl et al., 2002; Bjorner et al., 2004), and the studies agree that labeling allows product differentiation that is rewarded in the market. Similar trends have been reported in fair trade product markets, which are also built on ethical concerns (e.g. Bacon, 2005).

The existing literature on eco-labeling and green consumerism, as well as on fair trade, has been framed within a classical market context where price and quality are the drivers of consumer choice. However, it seems possible that consumers are also concerned about the choices made by other consumers. In fact, it is not at all clear that people's consumption decisions are made independently of social context. For instance, under the desire to conform to certain social norms – or in the presence of status concerns – some individuals may be willing to pay a higher price premium for green products the more widespread green consumerism is in society. For example, in the case of voluntary contributions it has been shown that conformity to what others do is one important factor affecting people's contributions (e.g. Alpizar et al., 2008; Frey and Meier, 2004; Shang and Croson, 2006). This reasoning is also in line with the growing empirical literature showing that people are concerned with their consumption relative to others in addition to the absolute level of consumption (Alpizar et al., 2005; Johansson-Stenman et al., 2002; Solnick and Hemenway, 1998, 2005).

Our main purpose with this paper is to test for conformity in green consumerism. In particular, we are interested in determining whether, and if so to what extent, individuals take the choices of others into account when making purchasing decisions with an environmental

dimension. Although a number of studies have used market data to analyze the demand for green products (Bjorner et al., 2004), such data does not lend itself to the analysis of social interactions, which is the concern of this study (Manski, 2000). The main difficulty lies in the fact that people's choices are typically only observable under the prevailing social setting, which makes it impossible to distinguish demand motivated by direct effects on utility (here other people's choices are irrelevant) from demand induced by social interactions (here demand depends on other people's choices). In this study, we therefore use a hypothetical choice experiment. Choice experiments (CE) have previously been used to investigate demand for food products with environmental characteristics (Carlsson et al., 2007) and offer a degree of flexibility that allows us to create different social scenarios.[1] In a CE, individuals are given a hypothetical setting and are then asked to choose their preferred alternative among several alternatives, each described by a number of attributes (the participants are usually asked to perform a sequence of choices).[2] The good used in our experiment is coffee, and the attributes are share of ecologically grown beans, share of fair trade beans, and price. In order to test for the effect of conformity in green consumption, we use three similar treatments – the only difference among them is the information given about the share of other people who buy 100% ecologically friendly coffee.

The paper is organized as follows: First we introduce a simple model that incorporates people's preferences for conformity in environmental quality. We then propose a method to test the presence of such preferences, namely a CE design and an econometric model. This is followed by a presentation of results and a concluding discussion.

2. A simple model of environmental conformity

There is rather extensive literature on analyses of demand for environmental quality in various market settings; see for example Amacher et al. (2004) and Cremer and Thisse (1999). Unlike those studies, the aim here is not to analyze the demand and supply of environmental quality. Instead, we use a simple model to illustrate how people's preferences for environmentally friendly goods can also be driven by conformity, i.e. a desire to conform to the societal norm regarding environmental quality. This aspect was not accounted for in the mentioned studies,

[1] In the literature on voluntary contributions, field experiments have been used to investigate conformity (see e.g. Alpizar et al., 2008). Since voluntary contributions typically take the form of one-time payments, it is relatively easy to test for conformity in experiments. In the analysis of purchasing and consumption decisions made on a regular basis, it is more difficult, although not impossible, to recreate a real world scenario in an experiment.
[2] For methodological overviews of choice experiments, see Alpizar et al. (2003) and Louviere et al. (2000).

and our aim is to investigate the existence of such an effect. We follow the approach by Akerlof and Kranton (2000) and assume that individuals derive utility from the identity effect of a particular consumption good (in addition to a direct utility effect of the good). Further, we assume that the utility function is additive separable between consumption and identity and can be written as:

$$U(q_c, q_0, I) = W(q_c, q_0) + I \quad , \tag{1}$$

where *c* represents the product with an environmental impact (here coffee), 0 represents a composite good, and q_c and q_0 represent the quantities consumed of the two product types. $W(\cdot)$ represents the direct utility function of consumption and is assumed to be concave in its arguments, and I is the identity or self-image component with $\frac{\partial U}{\partial I} > 0$. Furthermore, we assume that I is a function of the level of environmental quality of good q_c consumed by the individual, S_c, and of some norm in society $\overline{S}_c$. This could for example be the average level of environmental quality. Specifically,

$$I(S_c, \overline{S}_c) = \beta_1 S_c - \beta_2 [S_c - \overline{S}_c]^2, \tag{2}$$

where β_1 and β_2 are positive.[3] An increase in the difference between the environmental quality chosen by the individual and the society norm affects the self-image of the individual negatively, i.e. $\frac{\partial I_j}{\partial(|S_c - \overline{S}_c|)} < 0$. The budget restriction is $y = q_c p(S_c) + q_0$, where the price of the composite good is normalized to one. The price of the environmental good is an increasing function of its quality level. For simplicity, we assume a linear relation between environmental quality and price. Specifically, $p(S_c) = dS_c$, where d is a positive constant. Furthermore, our experimental design (introduced in the next section) presents environmental quality as the share of ecologically friendly coffee beans in one packet of coffee. We therefore assume that q_c is equal to one. Using this quantity restriction and the linear price assumption, the budget constraint takes the following form: $q_0 = y - dS_c$. Substituting in this expression and the expression for identity, I, we can rewrite the utility function as:

[3] In this simple model, identity does not depend on level of consumption, but only on environmental quality. For a given good, this is not particularly restrictive, and it is not unrealistic to assume that the identity effect relates to the environmental quality irrespective of the size of the consumption.

$$U(S_c;\bar{S}) = W(1, y - dS_c) + \beta_1 S - \beta_2[S_c - \bar{S}_c]^2 . \quad (3)$$

Maximizing (3) with respect to the environmental quality, S_c, we obtain the following first order condition:

$$W'(1, y - dS_c^*)[-d] + \beta_1 - 2\beta_2[S_c^* - \bar{S}_c] = 0 . \quad (4)$$

To find the effect of a change in $\bar{S}$ on the optimal choice of S_c^*, we total differentiate (4) and solve for $\frac{dS_c^*}{d\bar{S}_c}$:

$$\frac{dS_c^*}{d\bar{S}_c} = \frac{2\beta_2}{2\beta_2 - d^2 W''} . \quad (5)$$

Since direct utility $W(\cdot)$ is concave, it is easy to see that $0 < \frac{\partial S_c^*}{\partial \bar{S}_c} < 1$; i.e. a marginal increase in the overall consumption of environmental quality in society induces a less than proportional increase in the individual demand for quality. Note that equation (5) represents an outward shift of the demand function $S_c^*(d, \bar{S}_c)$. Accordingly, the individual's willingness-to-pay (WTP) for environmental quality is such that $\frac{dWTP_c}{d\bar{S}_c} > 0$ (note that the marginal WTP is given by the inverse demand function $MWTP_c(S_c, \bar{S}_c)$).

3. The Choice Experiment

In order to test whether conformity drives the demand for environmental goods, we designed a CE concerned with the choice of coffee and applied it to a sample of Swedish consumers.[4] Retail coffee, which is the focus of our attention, is a fairly simple and homogenous good in terms of taste[5] and quality. In fact, the difference in quality of coffee beans is smaller in Sweden than in most other countries (Durevall, 2007). To make the choice even simpler we informed the respondents that all coffee in the CE corresponded in taste to the coffee they

[4] Sweden is one of the world's largest consumers of coffee in per capita terms (ICO, 2005).
[5] We restricted the CE to only brewed coffee, and consequently did not include other coffee types such as cappuccino, café latte, and macchiato.

usually buy. In a relatively recent development, certified ecological, organic, and fair trade coffees have been introduced in the market (Lewin et al., 2004). As with many other products, this has occurred in response to increasing consumer concerns about environmental and social aspects of production. Eco-labels signal that the coffee beans were grown and processed using practices that preserve biodiversity and minimize pollution of surrounding water bodies in the growing areas. Such practices include planting local trees between coffee bushes to provide shade and preserve the ecological habitat (as opposed to mono-cropped full-sun plantations), using organic fertilizers and pesticides (rather than chemical fertilizers), recycling water in the production process, and proper disposal and treatment of residues from production. While eco-labels are mainly concerned with impacts on local ecosystems, fair trade labels focus on the livelihoods of farmers. Fair trade coffee beans are bought directly from cooperatives of small and typically poor farmers who are guaranteed a minimum price before harvest. This price is higher than the market price. Fair trade labels thus signal a reduced vulnerability of local farmers. Although the market share of ecological and fair trade coffee is still relatively small – on average less than 2% in the developed world – it is the fastest growing segment in the coffee markets.[6]

The CE was conducted through a mail survey in May 2007. The population that the sample was drawn from was defined as those between 20 and 75 years of age with a permanent address in Sweden. A sample of 2,100 individuals was randomly selected from the Swedish census registry; for each treatment we sent out 700 surveys. We took a number of steps to design a questionnaire that was easy to understand, plausible, and meaningful to the respondents. For example, we held a number of focus groups and conducted a small pilot study (100 surveys). The final questionnaire consisted of three parts: The first part included questions about the household habits regarding coffee consumption, the second contained the CE, and the third part questions about the respondent's socio-economic status. The introduction to the CE briefly explained the purpose of the survey and described the attributes.

In each choice situation, the CE respondents had three alternatives, each described by three attributes: (i) the share of ecologically grown beans, (ii) the share of fair trade beans, and (iii)

[6] Coffee was traditionally traded as a generic commodity. However, over the last few years differentiated coffees have become more important in the market. It has been estimated that differentiated coffees (differentiated by quality, origin, production process, etc.) make up about 12% of the total imports in the developed markets of North America, Western Europe, and Japan. The U.S. market for differentiated coffees grew from 9% to 13% between 1999 and 2002 (Lewin et al., 2004). It is estimated that the value of sustainable coffees (ecological, organic, and fair-trade) is about US$530 million and that it has benefited about 750,000 farmers (Bacon, 2005).

the price per packet. The first attribute is directly concerned with local ecosystems whereas the second relates to the livelihoods of the farmers. While these two aspects may sometimes be intertwined, there is not necessarily a direct relation between them. Although we are mainly interested in studying people's green preferences, the inclusion of fair trade adds a higher degree of complexity to the trade-off faced by respondents. In particular, it is not straightforward what the socially responsible choice is. The levels of the first and second attributes were 0%, 50%, and 100%, while the levels of the third attribute were 20 SEK, 25 SEK, 30 SEK, and 35 SEK. We asked respondents to choose one of three coffee products, without including an opt-out alternative. Again, in the survey it was explained that the coffee tasted the same as the kind they normally consumed. Our interest here is not to predict the market shares of various coffee products; instead we are interested in estimating the marginal WTP for environmental quality.

The different versions of the questionnaire were designed in order to test for conformity related to green consumption. The only difference among them was the information given about the consumption decisions of other consumers, which was given prior to the presentation of the choice sets and in connection with an example. The script in Version 1 of the questionnaire reads:

> "Imagine that **10%** of all coffee consumers choose the alternative with 100 % ecological beans."

In Versions 2 and 3 of the questionnaire, the proportion of green consumers (in bold letters above) was 50% and 90% respectively. The choice sets were created with a D-optimal design principle with the assumption that all parameters are zero, i.e. we do not consider utility balance (Carlsson and Martinsson, 2003; Huber and Zwerina, 1996). In total nine choice sets were generated, with three alternatives in each set. Figure 1 shows an example of a choice situation.

Figure 1: Example of a choice situation.

Coffee characteristics	Coffee 1	Coffee 2	Coffee 3
Share of ecologically grown beans	50 %	100 %	0 %
Share of fair trade beans	50 %	0 %	0 %
Price per ½ kilo coffee	30 SEK	35 SEK	20 SEK
Your choice (mark <u>one</u> alternative)	☐	☐	☐

In order to reduce the probability of a hypothetical bias, we followed Carlsson et al. (2005) and used a cheap-talk script. The script read as follows:

> In many attitude surveys the experience is that people often respond in one way but act differently. It is particularly common that one states a higher willingness to pay than what one is actually willing to pay for the good in the store. We ask you to make your choices considering your actual food budget. A higher price means that you have to reduce your consumption of other goods.

See Appendix for a scenario and attributes description.

4. Econometric Model

Following from the theoretical model, our econometric specification tests whether people's WTP for environmental quality increases in the average share of environmental quality bought by other consumers. Since we only observe the choices and not the preferences of the respondents, we apply a standard random utility model in the analysis. Note that our experiment only allows us to estimate the potential impact of the norm on the WTP for the share of ecological coffee. However, we can look at the difference in WTP among the various treatments in order to test for a potential impact of conformity. Since the demands for fair trade and ecological coffee might be substitutes in the sense that both can entail social and moral considerations, we also test whether the norm regarding ecological coffee has an impact on the WTP for fair trade coffee. We hence assume a simple linear indirect utility function where the utility of alternative *i* for individual *k* is

$$V_{ik} = \alpha_i + \beta(\bar{S})' S_i + \delta(\bar{S})' F_i + \lambda' \text{cost}_i + \varepsilon_{ik}, \qquad (6)$$

where S_i is the share of ecological coffee, F_i the share of fair trade coffee, and cost is the cost of alternative i.[7] We assume that β and δ depend on the share of ecological coffee consumed by others. We allow for a difference in preference between the first four and the last five choice sets, both because there could be learning and/or fatigue effects and because the effect of the information in the scenario could be limited for the last choice sets. For example, Ladenburg and Olsen (2007) find that an instructional choice set will only have an influence on the first choice sets, but not on the last. Although the experiment is generic, there might be other reasons why respondents opt for one of the alternatives, and we control for this with two alternative specific constants. We assume that the two alternative specific constants are randomly distributed with a normal distribution, i.e. we estimate a random effects model. The model is estimated with simulated maximum likelihood. From the utility specification in (7), we can estimate the marginal WTP for the two attributes, which is the ratio of the attribute coefficient and the marginal utility of income, λ (Hanemann, 1984). Since we are interested in the marginal WTP for a given treatment, we want to compare the following three WTP measures:

$$WTP\ S_i(\bar{S}=10\%) = \frac{\beta(\bar{S}=10\%)}{\lambda}$$
$$WTP\ S_i(\bar{S}=50\%) = \frac{\beta(\bar{S}=50\%)}{\lambda} \quad . \tag{7}$$
$$WTP\ S_i(\bar{S}=90\%) = \frac{\beta(\bar{S}=90\%)}{\lambda}$$

5. Results

Out of the 2,100 questionnaires sent out (see Section 3 for sampling details), 28 were returned due to address unknown. One reminder was sent out after 10 days to those who had not replied. In total 861 individuals returned the questionnaire (implying a response rate of 41%), of which 768 were available for analysis due to non-responses to various questions and to the fact that some respondents did not consume coffee. Although all 768 individuals did not answer all nine choice sets, they are still included in the analysis. Table 2 presents the results of the random parameter logit model. The model is estimated with simulated maximum likelihood using Halton draws with 500 replications; see Train (2003) for details on simulated maximum likelihood and Halton draws.

[7] In the theoretical model we only included the ecological aspects of the good, but it would be fairly straightforward to include a fair trade aspect as well. If we assume additive separability between these two aspects, as we do in our empirical specification, then the main results of the model still hold.

Table 1. Results of the random parameter logit model; p-values in parentheses.

	Coefficient
Share ecologically friendly beans	0.0130
	(0.000)
Share ecological * Treatment 50%	0.0005
	(0.604)
Share ecological * Treatment 90%	-0.0001
	(0.998)
Share fair trade beans	0.0126
	(0.000)
Share fair trade * Treatment 50%	0.0005
	(0.604)
Share fair trade * Treatment 90%	0.0023
	(0.299)
Price	-0.1415
	(0.000)
Share ecological * First four choice situations	0.0121
	(0.000)
Share fair trade * First four choice situations	0.0080
	(0.000)
Price * First four choice situations	-0.0494
	(0.000)
Parameter Alternative 1	0.0695
	(0.163)
Standard deviation Alternative 1	0.4750
	(0.000)
Parameter Alternative 2	0.1264
	(0.000)
Standard deviation Alternative 2	0.0131
	(0.933)
Respondents / Choice sets	768 / 6571
Pseudo-R2	0.08
Log-likelihood	6664

Both alternative specific constants are positive and one is significant. Thus, despite the experiment being generic, there is a tendency for respondents to prefer the first and second alternative rather than the third. The attributes Share ecological beans, Share fair trade beans, and Price all have a significant effect on the choices. Respondents are more likely to buy a given type of coffee the higher its share of ecologically grown and fair trade beans, and the lower its price. There is also a difference in behavior between the first four and the last five choice sets: Respondents care more about the shares of ecologically grown and fair trade beans and less about cost in the first four choice sets. We also tested whether the difference among the treatments varied between the first four and last five choice sets, and found that the interaction parameters were insignificant in all cases. The reason why respondents seem to care more about the shares and less about price in the beginning of the experiment could be that the scenario obviously focused on the environmental and fair trade aspects of coffee, and

that they therefore have their minds set on these attributes when they begin responding. Another explanation is that there are learning effects.

None of the interaction effects with the treatment dummy variables is significant. Thus, looking at the aggregate data, conformity does not seem to play a role. Although this is an interesting result, it is possible that there are differences between different groups of respondents. One natural focus in the literature has been to look at gender differences; there is some evidence that women are more socially oriented and less selfish (List, 2004; Andreoni and Vesterlund, 2001). There is also experimental evidence that women's social preferences are more sensitive to cues than are men's (Croson and Gneezy, 2004). In addition, some studies in the literature on relative standing suggest that women are more concerned with their relative positions in society than are men (Alpizar et al., 2005), and Ladenburg and Olsen (2007) found that women are more prone to starting point bias in a CE than men. These findings led us to test for gender differences both with respect to preferences for the attributes and the treatment effects. Some of the previous findings suggest that females are more sensitive to the information about the behaviors of others. At the same time, if women are less egoistic and more environmentally aware than men (Loureiro and Lotade, 2005; Zelezny et al., 2000), then they should be less concerned with the social conformity of green consumption. In order to identify a possible gender effect and its direction, we split the sample into males and females and estimated separate random parameter logit models. The models were estimated with simulated maximum likelihood using Halton draws with 500 replications, and the results are presented in Table 2.

Table 2. Results of random parameter logit models for males and females; p-values in parentheses.

	Females	Males
Share ecologically friendly beans	0.0086	0.0170
	(0.000)	(0.000)
Share ecological * Treatment 50%	0.0031	-0.0022
	(0.028)	(0.086)
Share ecological * Treatment 90%	0.0038	-0.0034
	(0.008)	(0.010)
Share fair trade beans	0.0085	0.0162
	(0.000)	(0.000)
Share fair trade * Treatment 50%	0.0040	-0.0026
	(0.012)	(0.066)
Share fair trade * Treatment 90%	0.0058	-0.0006
	(0.000)	(0.672)
Price	-0.1433	-0.1410
	(0.000)	(0.000)
Share ecological * First four choice situations	0.0110	0.0132
	(0.000)	(0.000)
Share fair trade * First four choice situations	0.0071	0.0089
	(0.015)	(0.001)
Price * First four choice situations	-0.0407	-0.0573
	(0.038)	(0.001)
Parameter Alternative 1	0.0671	0.0767
	(0.377)	(0.247)
Standard deviation Alternative 1	0.4669	0.4832
	(0.000)	(0.000)
Parameter Alternative 2	0.1626	0.0974
	(0.005)	(0.056)
Standard deviation Alternative 2	0.0917	0.0028
	(0.655)	(0.986)
Respondents / Choice sets	338 / 2916	430 / 3655
Pseudo-R2		
Log-likelihood	2957	3680

There is a clear difference between male and female respondents when it comes to the behavior in the CE. Using a likelihood ratio test we can reject the hypothesis of equal parameters between male and female respondents.[8] There is also a difference between male and female respondents with respect to the reaction to the information about the choices of others. Female respondents were more likely to choose a more ecologically friendly alternative and a more fair-trade friendly alternative in the two treatments where they were told that 50% and 90% of all other consumers choose the most ecologically friendly alternative. There is however no difference between the 50% and 90% treatment for females. For male respondents, the effect is the opposite although it is not always significant.

[8] When performing this test we need to account for the fact that the estimated parameters are confounded with the respective scale parameters. One way of dealing with this problem is to first test for a difference in scale between the data sets. We do this using the grid search procedure proposed by Swait and Louivere (1993). Given the estimated scale parameter, one can then test the hypothesis of equal parameters. When estimating the random parameter model with the grid search procedure, we used 25 Halton draws.

In order to interpret the results it is more enlightening to look at marginal WTP for the attributes. Table 3 presents mean marginal WTPs; standard errors are computed with the Delta method (Greene, 2000). We calculate the WTPs at sample means, implying that they are the weighted averages of the first four and last five choice sets.

Table 3. Mean willingness to pay.

	All	**Female**	**Male**
Share ecological: Treatment 10%	0.130	0.094	0.162
	(0.009)	(0.011)	(0.013)
Share ecological: Treatment 50%	0.133	0.116	0.147
	(0.009)	(0.012)	(0.012)
Share ecological: Treatment 90%	0.130	0.120	0.138
	(0.009)	(0.012)	(0.012)
Share fair trade beans: Treatment 10%	0.114	0.081	0.143
	(0.008)	(0.012)	(0.012)
Share fair trade: Treatment 50%	0.118	0.109	0.125
	(0.008)	(0.012)	(0.011)
Share fair trade: Treatment 90%	0.131	0.121	0.139
	(0.000)	(0.012)	(0.012)

Note: Standard errors in parentheses.

The results show that given the 10% treatment, respondents are on average willing to pay around 0.13 SEK for a 1 percentage point increase in the share of ecologically grown coffee beans, and 0.114 SEK for the same increase in the share of fair trade beans. This corresponds to a WTP premium of 13 SEK per packet of 100% ecological coffee compared with the 0% variety. The current actual price difference in stores is difficult to measure, but it is definitely lower than 13 SEK; in fact, it ranges from 0 to 2 SEK per packet. It is not surprising that the WTP is higher than the price difference, since there is a clear risk of hypothetical bias in this type of survey. Although we tried to reduce this bias with a cheap-talk script, it is far from obvious that we managed to eliminate it. However, this is not a major concern from our point of view, since we are only interested in the difference among the treatments.

Notably, male respondents have a higher WTP than female respondents in all treatments. Using a two-sample t-test, the difference is significant at the 1% level for the 10% and 50% treatments for ecologically friendly beans, but only for the 10% treatment for fair trade beans. Some studies show that females are more environmentally aware than men (Loureiro and Lotade, 2005; Zelezny, 2000). Since we do not control for differences in income, our results do not suggest that men necessarily are more environmentally aware than females. Furthermore, and as pointed out before, our main interest lies in comparing the potential

differences in treatment effects between the two groups. For females, the difference in WTP for ecological beans between the 10% and the 50% treatment is significant at the 5% level (using a t-test), while there is no significant difference between the 50% and the 90% treatments. Interestingly, the same pattern holds for fair trade beans. For females, the WTP for ecological and fair trade coffee increases when the social norm of consuming ecologically friendly coffee is strengthened. For male respondents, the pattern is the reverse: The WTP decreases when the norm is strengthened, and the difference in WTP between the 10% and the 50% treatments is significant at the 10% level for both ecologically friendly and fair trade coffee.[9]

Hence, we confirm our hypothesis of conformity for the female sample while we reject it for the male sample. Women are thus the ones who react to the information about the behaviors of others given in the experiment. This is similar to the finding by Ladenburg and Olsen (2007) that women are more prone to starting point bias in CE than men. As discussed earlier, this is consistent with some previous studies showing that females are more sensitive to cues than men (Croson and Gneezy, 2004) and that women are more concerned with their relative position in society than men (Alpizar et al., 2005). Thus, in the experiment women are more likely to try to find out what the socially appropriate thing to do is, and they do not want to be different from the others. Why do men behave in the opposite way? One explanation could be free riding, i.e. if everybody else in society is already contributing, there is little incentive to join in and also contribute to the public good. The possibility of males being more selfish than females (List, 2004) could partly explain the difference as well.

6. Discussion

Earlier studies using both revealed and stated preferences report that some consumers have a positive willingness to pay for ecologically friendly and fair trade products. With production of some of these products taking place far from the consumers, the results highlight the possible existence of altruistic preferences. Selfish motives, although less likely, are also possible as some consumers could view environmental soundness as an indicator of quality. However, the existing empirical and theoretical literature on green consumerism ignores the possible existence of social interactions. Using a choice experiment, we investigated whether

[9] Looking at the magnitudes of the point estimates for WTP we find that while female WTP for ecological coffee increases by 23% from the 10% treatment to the 50% treatment, male WTP decreases by 9%, and while female WTP for fair trade coffee increases by 34% from the 10% to the 50% treatment, male WTP decreases by 12%.

the premium that consumers are willing to pay for ecological coffee depends on the overall environmental behavior in society. We find that only women respond consistently to the different treatments, and their willingness to pay for ecologically friendly coffee increases when they are told that a large share of consumers choose the ecologically friendly alternative. For male respondents, the results are actually to some extent the opposite.

While testing for social conformity is obviously not a simple task, we believe that our proposed methodology is a useful approach. However, using hypothetical choice experiments to test the hypothesis of conformity is obviously not without problems either. In particular, there is a clear risk that respondents overstate their willingness to pay for ecologically friendly and fair trade coffee. At any rate, from our point of view this is not a major concern since we are only interested in the difference among the treatments. At the same time, the findings on the presence of conformity are strong since our test consists of a simple statement in the survey. Incorporating conformity as a driver of consumer choices when individuals make purchasing decisions with an environmental dimension can hence increase the explanatory power of such models.

References

Akerlof, G. and R. Kranton (2000). "Economics and identity", *Quarterly Journal of Economics*, 115(3), 715-53.

Alpizar, F., F. Carlsson and P. Martinsson (2003). "Using Choice Experiments for Non-Market Valuation", *Economic Issues*, 8, 83-110.

Alpizar, F., F. Carlsson and O. Johansson-Stenman (2005). "How Much Do We Care About Absolute versus Relative Income and Consumption?", *Journal of Economic Behavior and Organization*, 56, 405-421.

Alpizar, F, F. Carlsson and O. Johansson-Stenman (2008). "Anonymity, reciprocity, and conformity: Evidence from voluntary contributions to a national park in Costa Rica", *Journal of Public Economics*, forthcoming.

Amacher, G., E. Koskela and M. Ollikainen (2004). "Environmental Quality Competition and Eco-Labeling", *Journal of Environmental Economics and Management,* 47, 284-306.

Andreoni, J. and L. Vesterlund (2001). "Which is the fair sex? Gender differences in altruism", *Quarterly Journal of Economics*, 116, 293-312.

Bacon, C. (2005). "Confronting the Coffee Crisis: Can Fair Trade, Organic, and Specialty Coffees Reduce Small-Scale Farmer Vulnerability in Northern Nicaragua?", *World Development*, 33, 491-511.

Bjorner, T. B., L. G. Hansen and C. S. Russell (2004). "Environmental labeling and consumers' choice—An empirical analysis of the effect of the Nordic Swan", *Journal of Environmental Economics and Management*, 47, 411–24.

Blend, J. R. and E. O. van Ravenswaay (1999). "Measuring Consumer Demand For Ecolabeled Apples", *American Journal of Agricultural Economics,* 81(5), 1072-1077.

Carlsson, F., P. Frykblom, and C.J. Lagerkvist (2005). "Using Cheap-Talk as a Test of Validity in Choice Experiments", *Economics Letters,* 89, 147-152.

Carlsson, F., P. Frykblom and C.J. Lagerkvist (2007). "Consumer Benefits of Labels and Bans on GM Foods – Choice Experiments with Swedish Consumers", *American Journal of Agricultural Economics,* 89, 152-161.

Carlsson, F. and P. Martinsson (2003). "Design Techniques for Stated Preference Methods in Health Economics", *Health Economics* 12, 281-294.

Cremer, H. and J-F. Thisse (1999). "On the Taxation of Polluting Products in a Differentiated Industry", *European Economic Review*, 43, 575-594.

Croson, R. and U. Gneezy (2004), "Gender differences in preferences", *Working Paper*.

Durevall, D. (2007). "Competition in the Swedish Coffee Market 1978 - 2002", *International Journal of Industrial Organization* 25, 721-739.

Frey, B. and S. Meier (2004). Social Comparisons and Pro-Social Behavior: Testing "Conditional Cooperation" in a Field Experiment, *American Economic Review*, 94, 1717-1722.

Greene, W. (2000). *Econometric Analysis*. New Jersey: Prentice-Hall.

Hanemann, M. (1984). "Welfare Evaluations in Contingent Valuation Experiments with Discrete Responses." *American Journal of Agricultural Economics*, 66, 332-341.

Huang C. L. (1996). "Consumer preferences and attitudes towards organically grown produce", *European Review of Agricultural Economics*, 23, 331-342.

Huber, J. and K. Zwerina (1996). "The importance of utility balance in efficient choice designs", *Journal of Marketing Research*, 33, 307-317.

International Coffee Organization ICO (2005). *Overview of the coffee market*, Document ICC-93-5. Accessible at http://dev.ico.org/documents/icc93-5e.pdf

Johansson-Stenman, O., F. Carlsson and D. Daruvala (2002). "Measuring Future Grandparents' Preferences for Equality and Relative Standing", *Economic Journal* 112, 362-383.

Johnston R. J., C. R. Wessells, H. Donath, and F. Asche (2001). "Measuring Consumer Preferences for Ecolabeled Seafood: An International Comparison", *Journal of Agricultural and resource Economics*, 26(1), 20-39.

Ladenburg, J. and S. B. Olsen (2007). **"**Gender specific starting point bias in choice experiments: Evidence from an empirical study", *Working paper*.

Lewin, B, D. Giovannucci and P. Varangis (2004). "Coffee Markets: New Paradigms in Global Supply and Demand", *Agriculture and Rural Development Discussion Paper 3*, World Bank, Washington DC.

List, J. (2004). "Young, selfish and male: Field evidence of social preferences", *Economic Journal* 114, 121-149.

Loureiro, M. L. and J. Lotade (2005). "Do fair trade and eco-labels in coffee wake up the consumer conscience?" *Ecological Economics* 53, 129-138.

Louviere, J., D. Hensher, and J. Swait (2000). *Stated Choice Methods*. Cambridge: Cambridge University Press.

Manski, Charles F. (2000). "Economic Analysis of Social Interactions" *Journal of Economic Perspectives*, 14, 115-136.

Nimon W. and J. Beghin (1999). "Are Eco-Labels Valuable? Evidence from the Apparel Industry", *American Journal of Agricultural Economics*, 81, 801-811.

Shang, J. and R. Croson (2006). "Field Experiments in Charitable Contribution: The Impact of Social Influence on the Voluntary Provision of Public Goods", *mimeo*.

Solnick, S. and D. Hemenway (1998). "Is More Always Better?: A Survey on Positional Concerns", *Journal of Economic Behavior and Organization* 37, 373-383.

Solnick, S. and D. Hemenway (2005). "Are positional concerns stronger in some domains than in others?", *American Economic Review* 95, 147-151.

Sterner, T. (2003). *Policy Instruments for Environmental and Natural Resource Management*, RFF Press, Washington.

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

Teisl M. F., B. Roe, and R. L. Hicks (2002). "Can Eco-Labels Tune a Market? Evidence from Dolphin-Safe Labeling", *Journal of Environmental Economics and Management*, 43, 339-359.

Train, K. (2003). *Discrete Choice Methods with Simulation*. New York: Cambridge University Press.

Zelezny, L., P. Chua and C. Aldrich (2000). "Elaborating on gender differences in environmentalism", *Journal of Social Issues*, 56, 443-457.

Appendix: Scenario and Attributes Description.

Imagine that you are standing in the local food store and that the coffee brand with the roast that you normally buy offers three different coffee products. These are described with three characteristics: share of ecologically friendly beans, share of fair trade beans, and price. In nine different choice situations, only these characteristics are varied. Please, mark the coffee product that you would choose in each situation. You should only mark **one** choice in each situation. The three characteristics are described below.

Share ecologically friendly beans: 0% 50% 100%
Ecologically grown beans means that only environmentally friendly methods that preserve the biological diversity and minimize pollution in the ground and in water are allowed on the plantation. Chemical fertilizers and artificial manure are not allowed, and trees should be planted between the bushes; this is particularly important for migratory birds. In addition to this, water and waste from the production process are treated in a good manner. Depending on the supply of coffee beans, it is sometimes the case that ecologically grown beans are mixed with conventionally grown beans. The taste of this coffee does not depend on its share of ecologically grown beans. The share of ecologically friendly beans is labeled on the package.

Share fair trade beans: 0% 50% 100%
Millions of farmers in developing countries are dependent on coffee production for their survival. The market price for coffee is often below the production cost. Fair trade beans means that a minimum price, above the market price, is guaranteed. The production should occur in such a way that health risks to the workers are minimized. In the case of child labor, the children's human rights must be fulfilled. Depending on the supply of coffee beans, it is sometimes the case that fair trade beans are mixed with conventionally grown beans. The taste of this coffee does not depend on its share of fair trade beans. The share of fair trade beans is labeled on the package.

Price: 20 SEK/pk 25 SEK/pk 30 SEK/pk 35 SEK/pk
The price is expressed as the price per ½ kilo packet.

In many attitude surveys, the experience is that people often respond in one way but act differently. It is particularly common that one states a higher willingness to pay than what one actually is willing to pay for the good in the store. We ask you to make your choices considering your actual food budget. A higher price means that one has to reduce consumption of other goods.

Below is an example of a choice situation. Mark the alternative you would pick if you had to choose among these three alternatives. For example, if you think that the alternative where you pay 35 SEK for coffee made from 100% ecologically friendly beans and 0% fair trade beans is the best compared with the other two alternatives, then mark Coffee 2.

"Imagine that 90% all of coffee consumers choose the alternative with 100 % ecological beans."

Example

Coffee characteristics	Coffee 1	Coffee 2	Coffee 3
Share of ecologically grown beans	50 %	100 %	0 %
Share of fair trade beans	50 %	0 %	0 %
Price per ½ kilo coffee	30 SEK	35 SEK	20 SEK
Your choice (mark <u>one</u> alternative)	☐	☒	☐