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**Sustainable food purchases in the Netherlands:
The influence of consumer characteristics**

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Abstract

In this paper socio-demographic characteristics of sustainable food consumers are studied by using actual purchasing data of 4412 households in a wide range of food products over a twenty week period in the months November 2008 till March 2009. Our results indicate that purchasing sustainable food products is still the exception rather than the rule. Socio-demographic characteristics are (weakly) related to the purchasing sustainable food items. Specifically, people with a higher education and those living in a more urban area are more likely to purchase sustainable products. Psychographic data on a subsample (N=1112) show a weak relation between sustainability concerns and sustainable behaviour. Scales measuring people's sustainability concerns specific to purchasing products (e.g., Ethical orientation scale) are better predictors of people's sustainable consumption than scales measuring people's general sustainability concerns (e.g., Connectedness to Nature scale). Since consumer characteristics seem to be of little predictive value of sustainable consumption it may be wise to shift the focus from investigating *who* the sustainable consumer is to *how* to make sustainable products successful. In the discussion we offer some initial guiding principles.

Keywords: sustainability, socio-demographic characteristics, consumption, fair trade, pro-environmental

Sustainable food purchases in the Netherlands

People's awareness that sustainability issues are important is growing (Dunlap, 1998; Leiserowitz, 2005). The last years have witnessed an increase in the number of sustainable food products that are available in the supermarkets and sustainable food consumption is increasing (Ekotelling, 2010). Besides, sustainability is a trending topic: Typing in 'sustainable' or 'environmentally friendly' into Google generates millions of hits. Celebrities like Emma Watson and Selena Gomez are starting fair-trade, eco-friendly clothing lines, top chefs claim to work mainly with organic food products, and the hybrid Toyota Prius car is such a big success that even New York City cab drivers drive a Prius (Gralla, 2008; NOS, 2008; PeopleTree, 2011). In other words, sustainable consumption seems to be a success. But is it?

In this paper we will provide an overview of sustainable purchases in the Dutch food market. Based on a literature review we have developed several hypotheses that we will empirically test. To this end we will use a large dataset in which the actual food purchasing behaviour of over 4000 households is documented. We will explore whether the trendiness and media salience of sustainability-related issues translate to actual consumer behaviour on the food market and we will investigate whether we can provide a profile of the sustainable consumer. More specifically, we will examine what characteristics can predict whether consumers purchase sustainable food products at all (i.e., the *occurrence* of sustainable purchases) and what characteristics can predict the percentage of sustainable food products that consumers purchase given that they bought at least one sustainable food product (i.e., the *extent* to which consumers purchase sustainable food). To answer these questions we study the relation between *socio-demographic characteristics* (e.g., age, education), *general sustainability concerns* (i.e., do people care about nature, the environment and the welfare of others in general), *product specific sustainability concerns* (i.e., do people take nature, the environment and the welfare others into account when purchasing products) and actual sustainable food purchases.

But first, let us define sustainable behaviour and sustainable food. We follow the definition by the Brundtland Commission of the United Nations that states that "sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (WCED, 1987). This implies that sustainable behaviour is behaviour that is less harmful for the inhabitants of the planet and the planet itself. With sustainable food we thus mean food products that are less likely to come at the expense of people, animals, and the planet.

Sustainable Food Consumption

Food consumption plays a crucial role in sustainability issues like climate change. Energy and pesticide use, waste, and greenhouse gas emissions during production, transport, and the consumption of food are just a few of the many negative consequence of food consumption (Jungbluth, Tietje, & Scholz, 2000; Weber & Matthews, 2008). Additionally, most food is not produced according to certified Fair Trade standards that would enable farmers and labourers in third world countries to provide a better livelihood for themselves. Producing changes in the food market during all processes involved from production to consumption thus leads to a big increase in the success of sustainability. This makes it extra relevant to investigate factors that foster sustainable food consumption (Engineering-the-Future-Alliance, 2010; Jungbluth et al., 2000; Stern, Dietz, Ruttan, Socolow, & Sweeney, 1997; Weber & Matthews, 2008; Wimberley & Bello, 1992).

Previous studies investigating how widespread sustainable behaviour is and which factors may foster sustainable behaviour, are often based on retrospective behavioural self-reports, purchasing intentions and preferences rather than on actual behaviour (e.g., Chrysoschoidis, 2000; Magnusson, Arvola, Hursti, Åberg, & Sjöden, 2001; Schifferstein & Oude Ophuis, 1998). Although self-reports often offer interesting information, measuring real behaviour may be more appropriate when wanting to know how customary sustainable purchasing behaviour is and what factors influence it. It is likely that people overstate their sustainable purchasing behaviour and their attitudes because of social desirability issues. Furthermore, intentions are not always a good predictor of actual purchasing behaviour (Paulhus, 2002; Sun & Morwitz, 2010), because of various barriers that hinder the effectuation of these intentions (De Pelsmacker, Driesen, & Rayp, 2005; De Pelsmacker, Janssens, Sterckx, & Mielants, 2006). In addition, people not always knowingly behave sustainably. People who show little environmental concern may purchase sustainable products without having sustainability-relevant reasons for it or without noticing the sustainable character of their purchase (e.g., Gatersleben, Steg, & Vlek, 2002; Olson, 1981). We overcome both the problem of over-reporting and under-reporting that may arise with self-report measures by using actual purchasing data.

Our research also adds to the existing sustainable food purchasing literature that uses behavioural data. The studies that investigated purchasing behaviour so far often did so for very narrowly defined purchase behaviour (e.g., coffee, De Pelsmacker et al., 2005; e.g., fair-trade, Ozcaglar-Toulouse, Shiu, & Shaw, 2006). To provide a clearer and complete view of sustainable purchasing behaviour, we will look at 27 food categories. Moreover, we will not only look at food purchases in the supermarket, but also at food purchases at the open market, and the specialist shop in order to get a complete understanding of sustainable food purchasing behaviour. Additionally, we will look at all facets of sustainable purchasing behaviour, so we will not look exclusively at fair trade, or organic, or animal friendly consumption, but at all these different sustainable food products at once. By incorporating all these instances of sustainable food consumption, we are able to offer a complete and thorough view on food purchasing.

1. How Widespread Is Purchasing Sustainable Food?

The first question we will investigate is how many people purchase sustainable food. Sustainability has become increasingly fashionable over the recent years. However, the question is whether this recent societal focus on sustainability translates into actual sustainable purchases. We will provide an overview of how customary sustainable consumption is by looking at actual food purchasing data.

2. Socio-Demographic Characteristics and Sustainable behaviour

Another question that we will investigate and that has intrigued many scholars is: What characterizes the sustainable consumer? Since the early 1970's there have been abundant studies that have tried to characterize the sustainable individual in terms of socio-demographic characteristics (e.g., D'Souza, Taghian, Lamb, & Peretiako, 2007; De Pelsmacker et al., 2005; De Pelsmacker et al., 2006; Fransson & Gärling, 1999; Nelissen, Perenboom, Peters, & Peter, 1987; Verhage & Henion, 1984). On the basis of these previous studies, it is not easy to say which factors predict sustainable behaviour. For example, some studies suggest that a larger household size is positively related to sustainable behaviour, whereas others suggest that a smaller household size is positively related to sustainable behaviour (Arcury & Christianson, 1990; Hughner, McDonagh, Prothero, Shultz, & Stanton, 2007; Oskamp et al., 1991; Stern, Dietz, Kalof, & Guagnano, 1995; Thompson & Kidwell,

1998). This induces at least one author to conclude that the only consistency across those studies is the inconsistency of the findings (Peattie, 2010).

These inconsistent findings can be partly explained by researchers looking into different kinds of sustainable behaviour, such as purchasing fair trade coffee (De Pelsmacker *et al.*, 2005) and recycling behaviour (Oskamp *et al.*, 1991). These behaviours may be predicted by different factors because choosing to recycle versus not to recycle has no financial consequences, whereas choosing fair trade coffee will be often more expensive than choosing 'regular' coffee. As such, different groups of sustainable individuals may emerge. Another explanation for these inconsistent findings may also be due to the fact that some studies measure attitudes, whereas others base their findings on retrospective self-reports of behaviour (e.g., Chryssochoidis, 2000; Magnusson *et al.*, 2001; Steg, Dreijerink, & Abrahamse, 2005). However, based on meta-analyses of this vast body of literature some socio-demographic characteristics can be identified that are more or less consistently related to sustainability attitudes and behaviour (e.g., Diamantopoulos, Schlegelmilch, Sinkovics, & Bohlen, 2003; Fransson & Gärling, 1999; Van Liere & Dunlap, 1980). We will therefore discuss these characteristics in more detail below.

The most consistent finding is that males tend to have more knowledge about sustainable issues compared to females, whereas females tend to perform more sustainable behaviours (Diamantopoulos *et al.*, 2003). We therefore posit that:

H1: Females are more likely to purchase sustainable food products than males.

Findings related to age appear to be less consistent, but research most often finds that younger people are more concerned about sustainability issues than older people (Diamantopoulos *et al.*, 2003; e.g., Howell & Laska, 1992; Straughan & Roberts, 1999). One explanation is that values and norms are different per generation (Bogt & Hibbel, 2000). Older people are more integrated in the existing social order systems and sustainability issues provide a threat to these order systems, since solving sustainability issues requires changes in existing habits, institutions and values. Therefore, it has been suggested that older people are less willing to accept these changes than their younger counterparts (Fransson & Gärling, 1999; Van Liere & Dunlap, 1980). Leading us to contend that:

H2: Younger people are more likely to purchase sustainable food products than older people.

Quite a number of studies have found positive correlations between education, sustainability concerns and sustainable behaviour (e.g., Canavari, Bazzani, Spadoni, & Regazzi, 2002; Jansson, Marell, & Nordlund, 2011). Several studies found that those with a higher education are more likely to show pro-social behaviours in general -- like volunteering and donating blood (even when controlled for income, see Bekkers, 2004; Brooks, 2005; Healy, 2000; Putnam, 2000). The rationale behind this is that people with a higher education have satisfied the basic material needs like housing and as such have more resources (e.g., time, knowledge) to spend on higher order needs (Fransson & Gärling, 1999; Maslow, 1970). We, therefore, hypothesize that:

H3: People with a higher education are more likely to purchase sustainable food products than people with a lower education.

The relation between income and sustainable behaviour has generated more mixed evidence, with some studies finding a positive relation between income and sustainable behaviour and others not (Jansson et al., 2011; Maignan & Ferrell, 2004). The notion that a higher income is related to more sustainable behaviour is based on the idea that people with a higher income have more purchasing power (Tanner & Kast, 2003). Since sustainable food products often cost more people need to be willing and able to pay this surplus (De Pelsmacker *et al.*, 2005). People with a higher income will be more likely to be able to pay this surplus and as such will be more likely to purchase sustainable products (Fransson & Gärling, 1999). As such, we expect that:

H4: People with a higher income are more likely to purchase sustainable food products than people with a lower income.

Finally, people who live in urban areas are more likely to behave sustainably than their rural counterparts (Arcury & Christianson, 1990; Howell & Laska, 1992). Fransson and Gärling (1999) suggested that people in urban areas are more rapidly exposed to the consequence of unsustainable behaviour, such as air pollution. People who live in rural areas may not see the signs of environmental deterioration and therefore -falsely- believe that the environmental problems are not that pressing. In line with this, some recent research shows that atmospheric cues are important for beliefs in climate change. People are, for example, more likely to believe in global warming when the outdoor or indoor temperature is higher (Joireman, Truelove, & Duell, 2010; Li, Johnson, & Zaval, 2011; Risen & Gilovich, 2011). Taken as a whole, we hypothesize that:

H5: People living in urban areas are more likely to purchase sustainable food products than people living in more rural areas.

Our current examination of food purchasing data of households in the Netherlands enables us to test these hypotheses. We have access to the socio-demographic variables of these households and to the specifics of the food products that they bought. This allows us to investigate the relation between these socio-demographic characteristics and actual purchasing behaviour while using a large number of food categories. As such, we will be able to describe the profile of the Dutch sustainable food consumer.

3. Sustainability Concerns and Sustainable Behaviour

Increasing sustainability awareness and sustainability concerns are seen as an important factor in instigating sustainable behaviour. Campaigns like Earth Hour by the WWF contribute to this increased awareness. During Earth Hour people switch off their lights to signal that they want to pass on the planet to the next generations. The rationale behind this is that once people know how important it is to behave sustainably, and once they are concerned about sustainability issues they will start behaving sustainably (see also Schmuck & Schultz, 2002). Previous research, however, shows that the relation between concerns and behaviour is not always very strong (e.g., Gosling & Williams, 2010; La Piere, 1934; Steg et al., 2005). In order to shed more light on this issue, we will investigate the relationship between sustainability concerns and sustainable food consumption.

To examine the relationship between sustainability concerns and sustainable food purchases, we will ask a subsample of the respondents about their concerns towards sustainability. To be specific, we will study the predictive power of constructs that are indicative of *general* sustainability concerns (e.g., the balance of nature is very delicate and easily upset; New

Environmental Paradigm scale) and that according to the sustainability literature are related to sustainable behaviour (e.g., Dunlap & Van Liere, 1978; Jansson et al., 2011; Schultz et al., 2005). Moreover, we will also study the relationship between sustainable food purchases and product *specific* sustainability concerns (e.g., animal welfare is important when deciding whether to purchase a certain food item; Van Dam & Van Trijp, 2011).

General sustainability concerns

We will examine three constructs that are often being related to sustainability attitudes and sustainable behaviour in the literature to investigate the relation between sustainable food purchasing behaviour and general sustainability concerns. These are New Environmental Paradigm, Schwartz's Universal Values Orientation, and Connectedness to Nature (Dunlap & Van Liere, 1978; Mayer & Frantz, 2004; Schwartz, 1992). The *New Environmental Paradigm* (NEP) scale by Dunlap and van Liere (1978) measures environmental concern regarding the relationship between nature and mankind. It focuses, for example, on beliefs of how people disturb the balance of nature. The scale has been used many times to investigate the relationship between environmental concern and sustainable behaviour, showing that people who score higher on the New Environmental Paradigm scale show more concern for the environment and are more likely to behave sustainably (e.g., Jansson *et al.*, 2011; Schultz *et al.*, 2005). In line with existing evidence we hypothesize that:

H6: People who score higher on the New Environmental Paradigm scale are more likely to purchase sustainable food products than people who score lower on the New Environmental Paradigm scale.

The reduced *Schwartz' Universal Values Orientation* scale by Stern and colleagues (1995) measures the importance people attach to certain values such as wealth (i.e., egoistic values), respecting the earth (i.e., biospheric values), and equality (i.e., altruistic values). The underlying thoughts are that people who score higher on egoistic value orientation are especially focused on their own costs and benefits, making sustainable behaviour less likely. People who score higher on altruistic value orientation are more concerned with the equal distribution of benefits among people, making sustainable behaviour more likely. And, finally, people who score higher on biospheric value orientation are more concerned with nature and the environment, again making sustainable behaviour more likely (see e.g., Steg et al., 2005; Stern, Dietz, & Guagnano, 1998; Stern et al., 1995). In line with this we hypothesize that:

H7a: People who more strongly express biospheric values are more likely to purchase sustainable food products than people who less strongly express biospheric values.

H7b: People who more strongly express altruistic values are more likely to purchase sustainable food products than people who less strongly express altruistic values.

H7c: People who more strongly express egoistic values are less likely to purchase sustainable food products than people who less strongly express egoistic values.

Finally, the *Connectedness to Nature* construct by Mayer and Frantz (2004) measures to what extent people feel part of nature. The scale focuses on the extent to which people see themselves as part of the environment. Previous research has shown that the more people feel connected to nature the more they are expected to behave more sustainably (see e.g., Gosling & Williams, 2010). Therefore we contend that:

H8: People who score higher on the Connectedness to Nature scale are more likely to purchase sustainable food products than people who score lower on the Connectedness to Nature scale.

Product specific sustainability concerns

In order to investigate the relationship between product specific sustainability concerns and sustainable food consumption, we will study two constructs. We will study people's sustainable and utilitarian considerations when purchasing food and at people's Ethical Orientation (Brenton & Ten Hacken, 2006; Ozcaglar-Toulouse et al., 2006). We will look at people's considerations of product attributes when purchasing food by using a scale by Van Dam and Van Trijp (2011). This scale focuses on the importance that people attach to product specific *sustainable* attributes such as local origin and animal welfare, but also on the importance people attach to more product specific *utilitarian* attributes such as convenience and price. We expect that the more importance people attach to the sustainable attributes of a product the more likely they will be to purchase sustainable food items. In contrast, the more importance they attach to the utilitarian attributes of a product the less likely they will be to purchase sustainable food items. When people, for example, attach great importance to low prices they will be less likely to buy sustainable products (since sustainable items often cost more; De Pelsmacker *et al.*, 2005). In contrast, when people attach great importance to animal welfare, they will be more likely to purchase sustainable products. Therefore we contend that:

H9a: People who attach more importance to the sustainable attributes of a product are more likely to purchase sustainable food products than people who attach less importance to the sustainable attributes of a product.

H9b: People who attach more importance to the utilitarian attributes of a product are less likely to purchase sustainable food products than people who attach less importance to the utilitarian attributes of a product.

Finally, we will look into people's ethical orientation (Brenton & Ten Hacken, 2006; Ozcaglar-Toulouse et al., 2006). This construct taps into the extent to which people care about the ethical aspects of products. We expect, in line with previous findings (Brenton & Ten Hacken, 2006; Ozcaglar-Toulouse et al., 2006), that the more people care about ethics when purchasing products the more likely they are to purchase sustainable products. Therefore we hypothesize that:

H10: People who score higher on the Ethical Orientation scale are more likely to purchase sustainable food products than people who score lower on the Ethical Orientation scale.

Dependent measures

To draw a picture of who the sustainable consumer is, we will examine two facets of purchasing behaviour. Firstly, we will investigate the relation between people characteristics and the *occurrence* of sustainable purchasing. That is, what differentiates the people who purchase at least one sustainable food item from those who not purchase a sustainable food item at all? Secondly, we will investigate the relationship between the *extent* to which people purchase sustainably and their characteristics. Thus, provided that people purchased at least one sustainable food item, what differentiates those that purchase a higher percentage of sustainable food from those that purchase a lower percentage of sustainable food products?

4. Research Method

Participants and Design

A large-scale survey was conducted among Dutch consumers from the online panel of GfK Panel services Benelux during a twenty week period in the months November 2008 – March 2009. The GfK panel consists of a representative sample of 6000 households that daily register all purchases by EAN-barcode registration. Panel members daily register all purchases by EAN-barcode registration on a home scanner. For the registration of fresh products a codebook has been developed with ad hoc barcodes. Twice a week data are transferred from the scanner to the panel agency where they are validated and processed. This registration provides an overall picture of all food products that are purchased by the households. Apart from this daily registration of food products panel-members are periodically approached for additional data collection by surveys, that can be paper-and-pencil or on-line. Furthermore, the GfK data Panel also provides demographic information of the household and the representative of the household, see Table 1.

Table 1
Demographic information of the households

	N = 4412	N =1112
Gender		
Female	88.9%	86.1%
Male	11.1%	13.9%
Education		
Lower education	34.7%	30.1%
Average education	34.2%	36.4%
Higher education	31.1%	33.5%
Age		
20-29	4.6%	6.8%
30-39	13.6%	17.5%
40-49	23.8%	28.3%
50-64	35.7%	35.7%
65+	22.2%	11.7%
Income		
Below middle-income	20.3%	13.1%
Middle-income	28.3%	27.4%
Above middle-income	28.4%	29.8%
Twice above middle-income	22.2%	29.7%
Residential Area		
The three big cities	13.7%	11.4%
West	29.3%	30.6%
South	24.5%	24.8%
East	21.0%	22.6%
North	11.5%	10.7%

Note Table 1. Lower education represents primary school, LBO, and MAVO, average education represents MBO, HAVO/VWO and higher education represents HBO/WO. Below middle-income represents 700-1300 euro net monthly, middle-income represents 1300-1900 euro net monthly, above middle-income represents 1900-2700 euro net monthly and twice above middle-income represents 2700+ euro net monthly. The three big cities are Amsterdam, Rotterdam, The Hague, and their agglomerations. West are the provinces Noord-Holland, Zuid-Holland, and Utrecht, excluding the three big cities and their agglomerations. South are the provinces Limburg, Noord-Brabant, and Zeeland, East the provinces Overijssel, Gelderland, and Flevoland and North the provinces

Groningen, Friesland, and Drenthe. Please note that the residential areas (e.g., South) are listed in order of population density.

Purchase data are available for 4412 households. A subset of 1453 households was also asked to complete a questionnaire consisting of the New Environmental scale, the Schwarz' Universal Value scale, the Connectedness to Nature scale, the Ethical Orientation scale and the food attributes scale by Van Dam and Van Trijp (2011). A total of 1112 households (77%) completed the questionnaire.

The food purchases were categorized in 27 food categories (e.g., dairy products, meat, nuts), see Table 2. We will look at products from all these categories at once, to get a complete understanding of sustainable food purchasing behaviour, rather than looking merely at one product category. Additionally, we will look at different facets of sustainable purchasing behaviour, so not only at fair trade or organic consumption, but at fair trade, and organic, and animal friendly products. This provides a more complete view of sustainable purchasing behaviour. In addition, it has recently been shown that light users (98% of our sample) do not distinguish between all facets of sustainability, but rather perceive sustainability as one abstract construct (Van Dam & Van Trijp, 2011), arguing for our decision to sum all facets of sustainable behaviour. Finally, to encompass all purchasing channels, we will investigate food consumption by using purchasing data from the supermarket, the open market and the specialist shop.

Table 2

Product categories plus the percentage of sustainable products being purchased in that category.

Product Category	%	Product Category	%
meat substitutes	14.6%	cookies and pastries	0.6%
fish	13.8%	Cheese	0.7%
coffee and tea	11.8%	butter, margarine and oil	0.3%
eggs	4.9%	soft drinks	0.3%
potatoes, vegetables and fruit	2.6%	herbs and spices	0.3%
dairy products	1.9%	Alcohol	0.3%
cereals	1.9%	pre-packed meals	0.2%
rice and pasta	1.9%	Nuts	0.1%
sandwich spreads	1.7%	confectionery	0.1%
chocolate	1.2%	chips and salty biscuits	0.1%
baking products	1.1%	canned fruit	0.1%
meat	1.0%	Soup	0.1%
bread	0.8%	Beer	0.0%
canned vegetables	0.7%		

Measuring Sustainable Food

Following the UN definition of sustainability described above, we defined sustainable food products as those products that come to a lesser expense of people, animals, or the environment. The operational definition of sustainable food is limited by the possibilities to identify those food products unambiguously. As such we only incorporate food products that were unambiguously labelled as sustainable. Existing certification practices in the

Netherlands identify organic and ‘environmentally certified,’ which identify products that have a reduced environmental impact. Fair Trade, Max Havelaar and UTZ certification identify products that contribute to equal distribution of welfare to developing countries. MSC certification and ‘Free range’ identify products that contribute to animal welfare. Other potential contributions to sustainability, like local or regional production are ignored, due to lacking unambiguous certifications. Based on this, we limited the coding of products as “sustainable” to the following labels: organic (EKO and Bio), fair trade, Max Havelaar, or UTZ certified. For fish products we used the Marine Stewardship Council (MSC) label. In the product category eggs, we included the organic labelled eggs as well as free range eggs¹.

Measuring Sustainability Concerns

A subset of 1112 participants completed the questionnaire measuring the general (e.g., Connectedness to Nature scale) and specific (e.g., Ethical Orientation scale) sustainability concerns in order to investigate the relationship between purchasing sustainably and sustainability concerns.

General sustainability concerns. We shortened the New Environmental Paradigm scale as used by Dunlap, Van Liere, Mertig and Jones (2000) to nine items, based on a pre-test that showed that the reliability of the scale is not affected by shortening the scale. This scale measures environmental concern with items like, *humans are severely abusing the environment*, on a seven-point scale (1 = *not at all important*, 7 = *very important*, $\alpha = .90$), see Table 3 and the appendix.

We used an adapted version of the Schwartz’s Universal Values scale as used by Steg, Dreijerink, and Abrahamse (2005). The scale measures three sub-dimensions; altruistic ($\alpha = .81$), egoistic ($\alpha = .76$), and biospheric ($\alpha = .87$) values, see Table 3 and the appendix. Participants rated how important certain values are to them on a scale from 0 (*not at all important*) to 7 (*very important*). Moreover, they had the opportunity to indicate that the value goes against their principles (-1 = *goes against my principles*).

Table 3

The reliability, mean, and standard deviation of scales measuring sustainability attitudes

	Cronbach’s α	<i>M</i>	<i>SD</i>
Food purchasing concerns scale			
<i>Sustainability concerns, (1-7)</i>	$\alpha = .88$	4.62	0.97
<i>Practical concerns, (1-7)</i>	$\alpha = .49$	5.37	0.77
Ethical orientation scale, (1-7)	$\alpha = .90$	3.31	1.24
New environmental paradigm scale, (1-7)	$\alpha = .74$	4.78	0.79
Schwartz’ universal value scale			
<i>Egoistic, (-1-7)</i>	$\alpha = .76$	2.09	1.17
<i>Biospheric, (-1-7)</i>	$\alpha = .87$	4.38	1.35
<i>Altruistic, (-1-7)</i>	$\alpha = .81$	4.99	1.15
Connectedness to nature scale, (1-7)	$\alpha = .85$	4.42	1.22

The Connectedness to Nature scale was measured using a shortened three item version of the Connectedness to Nature scale (Mayer & Frantz, 2004). A pre-test showed that shortening the scale did not affect the reliability of the scale. The Connectedness to Nature scale measures the extent to which people feel part of nature, using items like: *I think of the natural world as*

a community to which I belong, $\alpha = .85$, on a scale from 1 (*not at all important*) to 7 (*very important*), see Table 3 and the appendix.

Product specific considerations. We measured how important people consider sustainability and utilitarian attributes when purchasing food by using a scale by Van Dam and Van Trijp (2011). Respondents were asked to rate the importance of the following attributes when buying food: taste, price, convenience, naturalness, local origin, environmentally friendliness, fair trade, animal welfare, and waste on a seven-point scale (1 = *not at all important*, 7 = *very important*). By using this scale we measured how important *utilitarian* product attributes are when buying food (i.e., taste, price, and convenience, $\alpha = .49$) and how important *sustainable* product attributes are when buying food (i.e., naturalness, local origin, environmentally friendliness, fair trade, animal welfare, and waste, $\alpha = .88$), see Table 3. To confirm that sustainable and utilitarian product attributes are two distinct factors, we performed a Principal Component Analysis (PCA), which confirmed the two factor structure (see Table 4).

Table 4

Varimax rotated component matrix of the Food Purchasing Concerns scale

According to you, how important are the following factors when purchasing food:	Component	
	1	2
environmentally friendliness	.859	.059
naturalness	.797	.152
fair trade	.794	.076
animal welfare	.761	.169
waste	.750	.011
local origin	.725	-.027
price	.210	.738
Taste	-.020	.705
convenience	-.033	.622

Recently, Ethical Orientation has been measured in two studies (Brenton & Ten Hacken, 2006; Ozcaglar-Toulouse et al., 2006). By combining items from both studies, a Dutch scale was developed and validated by Chen (2007) for application in the domain of sustainable products. Based on a pilot study, the scale was reduced to three items, measuring ethical orientation with items like, *I pay attention to ethical claims and logos (Fair Trade, Max Havelaar) of a product*, on a seven-point scale (1 = *not at all important*, 7 = *very important*, $\alpha = .90$), see Table 3 and the appendix.

5. Results and Discussion

We first investigated whether sustainable food consumption is widespread and whether we can characterize the sustainable consumer with socio-demographic characteristics. To answer these questions, we examined all food purchases of all 4412 respondents during the months November 2008 – March 2009.

How many people purchase sustainable food?

We investigated what percentage of people purchased at least one sustainable food product during the twenty week period in the months November – March. The results showed that 87.9% of the Dutch households purchased at least one sustainable food product during the data collection period of twenty weeks. In other words, 12.1% of the Dutch households in our sample did not buy a sustainable food item during the months November, December, January, February, and March 2008-2009. Furthermore, the data also showed that only 1.70% of all food products bought were sustainable products (For the percentage of sustainable food consumption per food category, see Table 2. For the raw volume data on the top ten sustainable food product categories, see Table 5). The upsurge in sustainability awareness of the recent years has thus not yet led to an upsurge in sustainable food consumption.

Product Category	Total volume	Volume sustainable	Manufacturer most successful product
meat substitutes	10,222	1,490	Alpro
fish	53,199	7,352	Iglo
coffee and tea	118,850	14,007	Albert Heijn
eggs	24,468	1,212	Unknown
potatoes, vegetables and fruit	840,937	22,025	C1000
dairy products	614,299	11,710	Albert Heijn
cereals	26,093	501	Bio Organic*
rice and pasta	54,618	1,048	Albert Heijn
sandwich spreads	89,879	1,521	Fair Trade*
chocolate	95,944	1,163	Verkade

Furthermore, only 1.97% of the households in the sample (N = 87) were heavy users and bought 15% or more sustainable products of their total food consumption. It thus seems that very few households buy sustainable food products regularly.

Table 5

The volumes of the ten most successful sustainable product categories and the manufacturer of the most successful sustainable product within that category.

*Note Table 5.*In both these categories runner-up is an Albert Heijn (private label) product.*

Socio-demographic characteristics

Next, we studied *who* buys these sustainable food products. First, we investigated which socio-demographic characteristics can best predict the *occurrence* of sustainable purchases. That is, do people purchase at least one food item or not? Second, we investigated which socio-demographic characteristics can best predict the *extent* to which people purchase sustainable products. That is, provided that people purchased at least one sustainable product, which socio-demographic characteristics can then best predict what percentage of their total food purchase is sustainable?

The occurrence of sustainable purchasing. To predict the *occurrence* of sustainable purchasing we conducted a Binary Logistic Regression analysis, with gender, education, age, income, and residential area as categorical predictors and sustainable consumption (0 = no, 1 = yes) as binary dependent variable. The Binary Logistic Regression analysis showed that these predictors added, as a set, significantly to the fit of the model $\chi^2(5) = 88.56$, $P < .001$, Nagelkerke $R^2 = .038$ and that the model fits the data, Hosmer & Lemeshow Goodness-of-Fit Test $\chi^2(8) = 10.95$, $P = .202$. According to the Wald statistic, all predictors significantly

predict choosing sustainable products. Specifically, the Wald statistic showed that women are more likely to purchase sustainably than men, $B = .406$, $SE = .135$, $P = .003$, that those with a higher education and income are more likely to purchase at least one sustainable product than those with a lower education and income, $B = .207$, $SE = .065$, $P = .001$, and $B = .206$, $SE = .047$, $P < .001$ respectively, and that older people are more likely to purchase at least one sustainable product than younger people $B = .288$, $SE = .042$, $P = .001$. Finally, those living in more urban areas are more likely to purchase at least one sustainable product than those living in more rural areas $B = -.112$, $SE = .038$, $P = .003$, see Table 6.

Table 6

Logistic regression of occurrence of sustainable purchase on socio-demographics

	B	SE	Wald (df = 1)	P	Exp. B	95% C.I. for Exp (B)	
						Lower	Upper
Gender	0.406	0.135	9.060	.003	1.500	1.152	1.954
Education	0.207	0.065	10.279	.001	1.230	1.084	1.396
Age	0.288	0.042	46.069	.000	1.334	1.227	1.449
Income	0.206	0.047	19.385	.000	1.229	1.121	1.346
Region	-0.112	0.038	8.619	.003	0.894	0.830	0.964

The extent of sustainable purchasing. Next we researched what socio-demographic characteristics predict the *extent* to which people purchase sustainable products provided that they purchased one sustainable product. To this end, we only selected the households that purchased at least one sustainable product during the twenty week period of the study. We conducted an analysis of variance (ANOVA) with gender, education, age, income, and residential area, as predictors and percentage of sustainable consumption as a continuous dependent variable. The ANOVA showed that, except for gender, all predictors had a significant effect. The ANOVA showed that those with a higher education are more likely to purchase sustainable food items than those with a lower education $F(2, 3877) = 24.19$, $P < .001$ and that those with a lower income are more likely to purchase sustainably than those with a higher income $F(3, 3877) = 5.67$, $P = .001$. Furthermore, the ANOVA showed that age was a significant predictor $F(4, 3877) = 5.91$, $P = .001$. Specifically the ANOVA showed that older people are more likely to purchase sustainably than younger people, with a notable exception of those in the youngest age group (20 -29 years old) who are most likely to purchase sustainably. Finally, the ANOVA showed a significant effect of residential area $F(4, 3877) = 4.77$, $P = .001$, showing that people living in more urban areas are more likely to purchase sustainably than people living in rural areas. Again, there is an exception, that is, those living in the North (the least densely populated area of the Netherlands) are as likely to purchase sustainably as those living in more urban areas.

Summarizing, both the *occurrence* and the *extent* of sustainable food purchasing is weakly related to socio-demographic characteristics. Hypothesis 1 (i.e., women are more likely to purchase sustainably than men) is partially supported: the occurrence of sustainable purchasing is related to gender, but the extent of sustainable food purchasing is not. In other words, women are more likely than men to purchase a sustainable product, but once they bought a sustainable product, women are not more likely than men to buy more sustainable products. Hypothesis 2 (i.e., younger people purchase more sustainable food than older people) is only partially supported. Older people are more likely to purchase at least one sustainable

product than younger people. Also the extent to which older people in general purchase sustainable products is larger than the extent to which younger people purchase sustainable food products. However, people in the youngest age group (20-29 years old) are the most likely to purchase sustainably. There thus seem to be many sporadic sustainable consumers among the elderly, whereas the heavy users are more likely to be found in the youngest age group. Hypothesis 3 (i.e., those with a higher education purchase more sustainable food than those with a lower education) is supported. People with a higher education are more likely to purchase a sustainable food item, and they are more likely to buy a larger percentage of sustainable food products than those with a lower education. Hypothesis 4 (i.e., people with a higher income purchase more sustainable food than those with a lower income) is only partially supported. As expected, people with a higher income are more likely to purchase a sustainable food item than people with a lower income. However, people with a lower income are more likely to purchase a larger percentage of sustainable products. This indicates that there seem to be many sporadic sustainable consumers among those with a higher income, whereas the heavy users are more likely to be found in the lower income groups. Despite the (often) higher costs of sustainable products, those with a lower income are thus more likely to purchase a larger amount of sustainable products. Finally, Hypothesis 5 (i.e., people living in urban areas purchase more sustainable food than those living in more rural areas) is supported. People in more urban areas are more likely to purchase at least one sustainable food product, plus they are more likely to purchase more sustainable food products than people in rural areas. Please note that there is an exception to this. That is, the people living in the North (the least densely populated area of the Netherlands) are as likely as those living in the more populated areas of the Netherlands to purchase a larger amount of sustainable food.

In short, most hypotheses are partially supported, but we find the stronger support for Hypotheses 3 and 5, indicating that people with a higher education and those living in more urban areas of the Netherlands are more likely to behave sustainably than people with a lower education and those living in more rural areas.

Sustainability Concerns and Sustainable Behaviour

On the basis of our subsample of 1112 respondents, we investigated whether sustainability concerns are related to sustainable behaviour. Specifically, we studied the relation between purchasing sustainable products, general sustainability concerns (e.g., do people care about nature, the environment and the welfare of others in general), and product specific sustainability concerns (e.g., do people take nature, the environment and the welfare of others into account when purchasing products). First, we investigated the predictive power of general sustainability concerns and second the predictive power of product specific sustainability concerns. In addition, we once more made the distinction between the *occurrence* of sustainable purchases (i.e., do people purchase sustainable products at all) and the *extent* to which people buy sustainable (i.e., the percentage of food products people purchase provided that they bought at least one sustainable product).

General sustainability concerns.

The occurrence of sustainable purchasing. We investigated the predictive value of the New Environmental Paradigm, the Schwartz's Universal Values scale, and the Connectedness to Nature scale on whether people purchase a sustainable food item or not. To this end, we used a Binary Logistic Regression analysis, which showed that the three scales combined did not increase the predictive power of the model, $P = .353$.

The extent of sustainable purchasing. Hereafter, we investigated whether we could predict the extent to which people purchase sustainable food items with the New Environmental Paradigm, the Schwartz's Universal Value scale, and the Connectedness to Nature scale. To this end, we selected the households that purchased at least one sustainable product during the twenty week period of the study and then investigated whether we can predict the percentage of sustainable food products they bought with the general sustainability concerns scales. We conducted a Linear Regression in which we regressed the percentage of sustainable products respondents bought on the three scales. The regression showed that adding the scales increased the predictive power of the model, $F(5,973) = 12.00$, $P < .001$, $R^2 = .058$. The results showed that all sub-dimensions of the Schwartz's Universal Value scale increased the predictive power of the model; Biospheric values, $\beta = .23$, $P < .001$, egoistic values $\beta = -.07$, $P = .038$ and altruistic values, $\beta = -.14$, $P < .001$. In addition, when people scored higher on the New Environmental Paradigm they were more likely to purchase sustainable food products, $\beta = .08$, $P = .030$. The Connectedness to Nature scale did not significantly add to the model.

In sum, the general sustainability concerns are not related to the occurrence of sustainable shopping. Whether people consume sustainable food items or not is not related to the Schwartz's Universal Value, the New Environmental Paradigm or the Connectedness to Nature scale, therefore partially rejecting Hypotheses 6, 7, and 8. Nevertheless, the New Environmental Paradigm scale and Schwartz's Universal Value scale are related to the extent to which people purchase sustainably, partially supporting Hypotheses 6 and 7. Specifically, the results show that people scoring higher on the New Environmental Paradigm scale are more likely to purchase sustainable food items than people scoring lower on the New Environmental Paradigm scale. People showing more concern regarding the relationship between nature and mankind are thus more likely to behave sustainably, partially supporting Hypothesis 6. In addition, when people adhere more to biospheric values like preserving nature, they are more likely to buy sustainable food items, therefore partially supporting Hypothesis 7a. The results show that the stronger the altruistic values, like caring for the weak, the less likely people are to buy sustainable food items, therefore rejecting Hypothesis 7b. This finding is inconsistent with previous findings (e.g., Steg *et al.*, 2005). Finally, Hypothesis 7c is also partially supported. That is, people who adhere more to egoistic values like caring about money and material possessions, are less likely to purchase sustainable food items.

Product specific sustainability concerns.

The occurrence of sustainable purchasing. We studied whether product specific utilitarian and sustainable considerations (e.g., price, animal welfare) and the Ethical Orientation scale can predict whether or not people purchase sustainable products with a Binary Logistic Regression analysis. Ethical orientation did not contribute to the explanation, and the model fit was insufficient. After removing the Ethical Orientation scale from the equation the model showed an acceptable fit, with $\chi^2(2) = 13.222$, $P = .001$, Nagelkerke $R^2 = .022$ and Hosmer & Lemeshow Goodness-of-Fit Test $\chi^2(8) = 12.808$, $P = .119$. The Wald statistic showed that product specific sustainability considerations are positively related to purchasing sustainably, $B = .32$, $SE = .13$, $P = .001$. People who take sustainable attributes into consideration when purchasing food products, like local origin and waste, are more likely to buy at least one sustainable product. Product specific utilitarian considerations are negatively related to purchasing sustainably, $B = -.25$, $SE = .12$, $P = .041$. People who take utilitarian attributes into consideration when purchasing food products, like convenience and price, are less to purchase at least one sustainable.

Table 7

Logistic regression of occurrence of sustainable purchase on product specific concerns

	B	SE	Wald (df = 1)	P	Exp. B	95% C.I. for Exp (B)	
						Lower	Upper
Relevance of sustainability attributes	0.318	0.095	11.185	.001	1.374	1.140	1.655
Relevance of utilitarian attributes	-0.251	0.123	4.168	.041	0.778	0.612	0.900

The extent of sustainable purchasing. Next, we investigated whether we can predict the extent to which people buy sustainable food items with their food related concerns. For this purpose, we selected the households that purchased at least one sustainable product during the twenty week period of the study and subsequently investigated whether we could predict the percentage of sustainable food products they bought with the product specific sustainability concerns scales. We conducted a Linear Regression in which we regressed the percentage of sustainable products on the scale measuring importance attached to sustainable and utilitarian product attributes and the Ethical Orientation scale. The regression showed that these scales increase the predictive power of the model, $F(3,973) = 36.95$, $P < .001$, $R^2 = .103$. Both the importance that people attach to utilitarian and sustainable attributes when purchasing products reached significance. When people are concerned with sustainable attributes of food, they are more likely to buy a larger percentage of sustainable food items, $\beta = .09$, $P = .035$. In contrast, then people are concerned with utilitarian attributes of food, they are less likely to buy a larger percentage of sustainable food items, $\beta = -.12$, $P < .001$. Finally, the higher people score on the Ethical Orientation scale (i.e., the more people are concerned with ethical issues when purchasing products) the more likely they are to purchase sustainable food, $\beta = .24$, $P < .001$.

In sum, our results show that considering sustainable attributes when purchasing food, such as animal welfare, is related to both the occurrence and extent of sustainable food purchasing, thereby fully supporting Hypothesis 9a (i.e., People who attach more importance to the sustainable attributes of a product are more likely to purchase sustainable food products than people who attach less importance to the sustainable attributes of a product). In addition, our results show that considering utilitarian attributes when purchasing food, such as price, is related to both the occurrence and extent of sustainable food purchasing, thereby also fully supporting Hypothesis 9b (i.e., People who attach more importance to the utilitarian attributes of a product are less likely to purchase sustainable food products than people who attach less

importance to the utilitarian attributes of a product). The data show mixed results for the Ethical Orientation scale, which is related to the extent of sustainable food purchasing, but not to the occurrence of sustainable food purchasing. Therefore Hypothesis 10 (i.e., People who score higher on the Ethical Orientation scale are more likely to purchase sustainably than people who score lower on the Ethical Orientation scale) is only partially supported.

To conclude, the results show that the product specific sustainability concerns are better predictors of purchasing sustainable food than the general sustainability concerns (as in line with Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975; Mainieri, Barnett, Valdero, Unipan, & Oskamp, 1997). Still, even these product specific concerns scales are not very good in predicting sustainable food consumption. Only increasing awareness may thus not be enough: Even when people know sustainability is important, and actually find sustainability important, they do not always behave sustainably.

6. General Discussion

Sustainability is trendy and this trendiness has led to an upsurge in sustainability awareness the last years (De Pelsmacker *et al.*, 2006; Gralla, 2008; NOS, 2008; PeopleTree, 2011). The question is whether this recent upsurge in sustainability awareness has also led to more sustainable food purchases. We looked at purchasing data of Dutch consumers and the results show that even though sustainability is trendy most people still do not purchase sustainably. Only a small percentage of all food purchases is sustainable, only few households purchase sustainable food regularly, and the vast majority of the people do only very irregularly purchase sustainable food products. Concerning instigating sustainable behaviour there is thus still a lot to do.

Socio-demographic characteristics

In line with previous research (e.g., Fransson & Gärling, 1999), we found that socio-demographic characteristics have low predictive power. Our results show that education and residential area are predictive of purchasing sustainably. Specifically, in line with previous research, we show that people with a higher education are more likely to purchase sustainable food products than people with a lower education and people living in more urban areas are more likely to purchase sustainable food products than people living in more rural areas (e.g., Arcury & Christianson, 1990; Canavari *et al.*, 2002; Fransson & Gärling, 1999; Howell & Laska, 1992; Jansson *et al.*, 2011).

Our results mixed findings for socio-demographic characteristics like age, gender and income. Our results show that although women are more likely to buy *a* sustainable food item (rather than not buying sustainable at all) they are not more likely to buy *more* sustainable food products than men. This contrasts with findings in previous meta-analyses which show that women are more likely to behave sustainably (e.g., Diamantopoulos *et al.*, 2003).

Furthermore, our results show that older people are more likely to purchase sustainable food products than younger people. However, people in the youngest age group (those between the ages of 20 and 29) are most likely to purchase a larger percentage of sustainable food products. In line with previous research, we find rather mixed evidence for the relation between income and sustainable behaviour (e.g., Fransson & Gärling, 1999; Jansson *et al.*, 2011; Maignan & Ferrell, 2004). Our results show that people with a higher income are more likely to buy *a* sustainable food item (rather than not buying sustainable at all) than people with a lower income, however, they are not more likely to buy *more* sustainable food products than people with a lower income. In fact, people with a lower income are more likely to purchase a larger percentage of sustainable food products than people with a higher income. It

thus seems to be the case that older people and people with a higher income are more likely to sporadically, or unintentionally, purchase a sustainable food product, but that the more heavy users are in fact younger people and people with a lower income.

For commercial companies and public policy officials our results on profiling the Dutch sustainable consumer may be rather disappointing. It appears to be difficult to make a solid profile on 'who' the Dutch consumer is. This makes it in turn difficult for companies and public policy officials to know who they have to target in order to increase sustainable behaviour. However, our results do hold some suggestions. People who have a lower education, a higher income and live in rural areas are lagging behind when it concerns sustainable food purchasing. Therefore, it may be efficient to specifically target these groups.

Sustainability concerns

We also investigated the relation between general sustainability concerns and sustainable behaviour and our results show that although there is a relation, that this relation is rather weak. In line with previous research we found that the Schwartz's Universal Value scale and the New Environmental Paradigm are related to purchasing a larger percentage of sustainable food products (e.g., Jansson *et al.*, 2011; Schultz *et al.*, 2005; Steg *et al.*, 2005; Stern *et al.*, 1998; Stern *et al.*, 1995). Specifically, our results revealed that people who adhere more to biospheric values are more likely to purchase sustainable food than people who adhere less to biospheric values. In contrast, people who adhere more to egoistic values are less likely to purchase sustainable food than people who adhere less to egoistic values. Surprisingly, we found the same pattern for altruistic values, such that people who adhere more to altruistic values are less likely to purchase sustainable food than those who adhere less to altruistic values. Finally, our results show that people who are more concerned about the balance between nature and mankind (i.e., those scoring higher on the New Environmental Paradigm) are more likely to purchase sustainable food. In our data-set, there was no relationship between feeling connected to nature (i.e., the Connected to Nature scale) and purchasing sustainable food.

Finally, our results show that the product specific sustainability concerns are better predictors of sustainable food consumption than general sustainability concerns. The product specific sustainability concerns can namely predict both the *occurrence* (i.e., do people purchase sustainable or not) and the *extent* to which people consumer sustainably (i.e., given that people purchase sustainable products, what percentage do they purchase). Specifically, when people care about sustainability attributes of food, like animal welfare, they are more likely to actually purchase sustainable food. In contrast, when people care more about utilitarian attributes of food, like price, they are less likely to actually purchase sustainable food (see also Van Dam & Van Trijp, 2011). Finally, when people care about ethics when buying products (i.e., does the product have a Fair Trade label), they are also more likely to purchase a larger percentage of sustainable food items.

Our results indicate that instigating sustainability awareness may not be sufficient for increasing sustainable consumption. People may think sustainability is important, but most of them do not behave accordingly. Also often named hurdles such as price and convenience seem to be not very predictive of sustainable behaviour. Even if people think that price is very important, they are not much less likely to purchase sustainable products (see also Tanner & Kast, 2003). The conscious deliberations and rational factors that often are assumed to play a major role in sustainable consumption do not appear to be that important after all. On the bright side: people do think that sustainability is an important issue, as the scores on the

sustainability scales suggest, see Table 3. This is encouraging for companies that have adopted a sustainable route, as it suggests that people do value sustainability.

Limitations

We have decided to aggregate all sustainability labels such as organic, eco-friendly and fair trade so to obtain one variable termed sustainable purchasing. It could be interesting to see whether different patterns of socio-demographic characteristics emerge when investigating the sustainability labels separately. It could be the case that the ethical sustainable, fair trade consumer is defined by different demo-graphic characteristics than the environmentally sustainable, eco-friendly consumer. We decided against this for several reasons. The first one is that we adhere to the definition of sustainability as defined by the Brundtland Commission of the United Nations stating that “sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (WCED, 1987). This implies that sustainable behaviour is behaviour that is both less harmful for the inhabitants of the planet and the planet itself. As such, we decided to incorporate both these components: environment (e.g., eco-friendly, BIO) and human and animal welfare (e.g., fair trade and UTZ) in our definition of sustainable behaviour. Therefore, we summed all separate labels under the umbrella of sustainability. The second reason is that light users (98% of our sample) do not differentiate between different kinds of sustainability such as fair trade and eco-friendly rather they see it as one big abstract construct (Van Dam & Van Trijp, 2011). It would be improper to make a distinction between different kinds of sustainability when our sample is not. Furthermore, this finding of light users seeing sustainability as one, rather than a fragmented construct, suggests that the findings of separately analyzing the labels would probably generate very similar results. That is, since our sample mainly consists of light users who do not make the distinction between all the different kinds of sustainability labels, their purchasing pattern for each label is most likely rather similar to the purchasing pattern of all sustainability labels aggregated.

Another possible limitation of our study is that we aggregated all product categories (e.g., coffee, meat, confectionery) into one umbrella category, that is, food. It could be the case that for each product category different clusters of consumers emerge in terms of socio-demographic characteristics. Or that for some product categories there would be stronger relationships with sustainability concerns than for others. We decided to aggregate all product categories so to generate a more complete and clearer overview. It could be interesting, however, to analyze all product categories separately. This is especially the case since some product categories are more successful in terms of sustainability (e.g., fish, coffee/tea) than others (e.g., beer, confectionery, see Table 2). For future research it would be interesting to see whether there are certain clusters of product categories that are more related with sustainability concerns and/or socio-demographic characteristics than others. It would be especially interesting to see what the common denominator is in these clusters and whether this common denominator can be defined by *consumer* characteristics or by *product* characteristics. Based on the study we reported here and on the many previous studies on linking socio-demographic characteristics to sustainable behaviour, we suggest that focusing on product characteristics may be more successful, since it has been shown that it is very difficult to characterize the sustainable consumer (e.g., Diamantopoulos, 2003; Peattie, 2010; for a study on clustering sustainable product based on product characteristics see Van Doorn & Verhoef, 2011).

Directions for future research

A question that needs future research is: What characterizes successful sustainable products? This is an especially important question since consumer characteristics seem to be of little predictive value. It may therefore be wise to shift the focus from investigating *who* the sustainable *consumer* is to *what* makes a sustainable *product* successful. There is not much research into this question, but we have some thoughts. Research has consistently shown that people prefer products that are balanced. Thus products that score good on all sorts of dimensions, rather than products that are extremely good on one dimension (e.g., Chernev, 2005; Simonson, 1989; Simonson & Tversky, 1992; Tversky & Simonson, 1993). The idea behind this is that people find extremity aversive (Simonson & Tversky, 1992). Simonson and Tversky (1992) argued that a product will be relatively more attractively rated, and is thus more likely to be chosen, when it is a balanced, intermediate product rather than when it is an extreme product in a choice set. When looking at sustainable products, it is salient that these products often stress the sustainability part the most. They seem to be rather extreme choices within the choice set. We therefore think that the most successful sustainable products might actually be those products that not only stress their sustainability dimension, but also other dimensions such as taste and ease. These products are the more balanced and intermediate options within the choice set, and therefore more likely to be chosen. To see whether we could find some evidence for this hypothesis, we looked at what characterizes products that are successful in the sense that they are often purchased within a category in our data set (see Table 5).

Anecdotally, we found that in our study one of the most successful sustainable products were Captain Iglo Fishsticks, Verkade chocolate bars (A-brands), Albert Heijn coffee (a high end supermarket private label) and Lidl cookies (a low end supermarket private label). What these products have in common is that people generally do not buy these products because they are sustainable, but because they are qualitatively good products -- or somewhat cheaper in case of the Lidl cookies. Brands that advertise their products mainly in terms of sustainability are less successful and only possess a very small market share. This indicates that if only all popular products were manufactured in a sustainable manner, this might largely increase the market share of sustainable products. It would therefore be wise to not only focus on encouraging sustainable consumer behaviour by educating and stimulating the consumer to do so, but also to focus on how products could be positioned in order to encourage sustainable behaviour.

7. Conclusions

In sum, our results indicate that there is still a lot to be gained in the sustainable food market. The market share of sustainable food is not nearly as high as it could be -- and maybe should be. Our findings show that it is difficult to characterize the sustainable consumer and that although sustainability awareness is perhaps important, it is not (yet) directly related to sustainable food consumption. Sustainability concerns do not always seem to translate into sustainable behaviour. New approaches to induce sustainable behaviour should therefore be explored. One way of doing this may be by focusing on the sustainable products rather than on the sustainable consumer.

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Footnote

1. In our sample we coded the following four types of eggs. Cage eggs, Cage free eggs, Free range eggs, and Organic eggs. In the Netherlands cage eggs means that the hens are placed in cages and that there are 18 hens per square meter. Cage free eggs entails nine hens per square meter and that these hens are free to walk around inside. Free range eggs entails that the hens can have unrestrained access to outside space. Inside there are about nine hens per square meter, but the outside space is four square meter per hen. Finally, Organic eggs entails that the hens also have four square meter per hen outside and there are about six hens per square meter inside. The forage of these hens is at least of 80% organic. We only consider Free range eggs and Organic eggs to be sustainable food.

Appendix: Concern measures

Ethical Orientation scale

I mainly purchase products of manufacturers that contribute to fair trade

I pay attention to the production method (environmentally friendliness, fair working conditions) of products that I buy

I pay attention to ethical claims and logos (Fair Trade, Max Havelaar) of a product

New Environmental Paradigm scale (Dunlap et al., 2000)

We are approaching the limit of the number of people the earth can support

Humans have the right to modify the natural environment to suit their needs

Humans are severely abusing the environment

Plants and animals have as much right as humans to exist

The balance of nature is strong enough to cope with the impacts of modern industrial nations

The so-called “ecological crisis” facing humankind has been greatly exaggerated

The balance of nature is very delicate and easily upset

Humans will eventually learn enough about how nature works to be able to control it

If things continue on their present course, we will soon experience a major ecological catastrophe

Schwartz's Universal Value scale (Steg et al., 2005; Stern et al., 1995)

Egoistic

Authority: the right to lead or command

Social power: control over others, dominance

Wealth: material possessions, money

Influential: having an impact on people and events

Ambitious: hard-working, ambitious, striving

Biospheric

Protecting the environment: preserving nature

Preventing pollution: protecting natural resources

Respecting the earth: live in harmony with other species

Unity with nature: fitting into nature

Altruistic

Social justice: correcting injustice, care for the weak

Helpful: working for the welfare of others

Equality: equal opportunity for all

A world at peace: free of war and conflict

Connectedness to Nature scale (Mayer & Frantz, 2004)

I think of the natural world as a community to which I belong.

I feel as though I belong to the Earth as equally as it belongs to me

Like a tree can be part of a forest, I feel embedded within the broader natural world