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Climate-friendly Products – to buy or not to buy?

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ABSTRACT

Although climate change is reported to be an important issue for European citizens, market relevance of climate-friendly labelled products remains limited. Various barriers such as low knowledge, distrust in labels, time preference and uncertainty/risk prevent consumers from acting according to their ethical attitudes. The aim of this contribution is to better understand the factors which influence consumers' purchase behaviour of climate-friendly labelled products with emphasis on knowledge, trust in labels and time preference. Based on the data obtained by an online survey with 6007 respondents in six European countries (DE, ES, FR, IT, NO, UK) in July 2015 a multinomial regression was conducted. Dependent variable was the actual buying frequency of climate-friendly food. Higher subjective knowledge had a positive impact while lack of trust in labels negatively influenced the probability of purchasing climate-friendly products. Test persons with higher time preference were less likely to buy climate-friendly products and vice versa. This is in line with theoretical considerations according to which the present saving of money and pleasure gains are valued higher than the possible benefits resulting of less future impacts of climate change. In contrast, the effects of different indicators of risk attitudes were ambiguous.

Keywords: Food labelling; consumer behaviour; attitude behaviour gap.

1 Introduction

Sustainability issues are gaining weight in the food sector. However, market shares are still low and various studies found that consumers' favourable attitudes towards environmental issues are only partly reflected in their buying behaviour (Kuckartz et al., 2007; Rückert-John et al., 2012; Laureati et al., 2013). The reasons for this phenomenon, frequently referred to as attitude-behaviour gap, are manifold. Distrust, information overload, limited knowledge and budget constraints are some of the reasons (Rückert-John et al., 2012; Vermeir and Verbeke, 2006). While on the one hand consumers' limited knowledge seems to be particularly relevant with respect to sustainability in food consumption (Reisch, 2012; Vanhonacker et al., 2013; Laureati et al., 2013) on the other hand information overload severely hampers rational decision making. Uncertainty and time preference which both are related to each other also may impede people form behaving in an environmentally-friendly manner. Immediate and certain satisfaction of needs such as pleasure (taste, convenience) and low expenditure compete with future and uncertain benefits such as health and environmental protection (e.g. Kahneman und Tversky, 1979).

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Climate change is reported to be an important issue for European citizens (Eurobarometer 2009) and many consumers are prepared to do their bit for the mitigation of global warming. One way of taking action is to adapt individual purchasing behaviour and to prefer products with lower impact on climate, i.e. products with lower CO2-footprint.

Carbon footprint (CFP) labels are an important means of communicating the climate-impact of products to consumers. Earlier studies showed that many consumers are interested in the introduction of CFP labels in order to be able to identify climate-friendly products (e.g. Gadema and Oglethorpe, 2011). Weidema et al. (2008) expected CFP labelling to be one promising approach to increase consumer awareness and discussions about the environmental impact of products. Guenther et al. (2012) identified 22 CFP labelling schemes worldwide, many of them still in an early stage. However, it is interesting that market relevance of different CFP labelling approaches remains limited. The UK label of the Carbon Trust was among the first and one large UK retailer intended to make extensive use of this label by introducing it for a wide range of products. In 2012 the retailer resigned from its initial plans to further promote CFP due to high costs and missing uptake of CFP labelling by other retailers (The Grocer 2012).

With regard to consistent consumer behaviour CFP labelling faces the same difficulties like other sustainability labelling schemes (see above). In the case of CFP labelling major barriers are supposedly consumers' low knowledge about the carbon footprint and about the impact of food consumption on climate change (e.g. Onozaka and McFadden, 2011; Hartikainen et al., 2014). Barriers which might be related are for example low trust in labelling in general, low perceived consumer effectiveness, high time preference and an inclination to riskier behaviour.

Time preference refers to the trade-off between current and future benefits (Smith et al., 2005; Cavaliere et al., 2014). A person with high time preference values immediate satisfaction higher than future satisfaction. The impact of time preference on people's choices has been demonstrated repeatedly regarding health decisions (Cavaliere et al., 2014; Smith et al., 2005; Komlos et al., 2004). With regard to climate-friendly consumer behaviour high time preference implies that immediate satisfaction of needs such as pleasure (taste, convenience) is valued higher than future benefits such as a liveable environment (i.e. lower negative effect on climate change). If climate-friendly products are more expensive than standard products, which is sometimes the case, then buying climate-friendly goods leads to reduced present consumption opportunities in other areas. Time preference and uncertainty/risk are interrelated. While present (higher) expenditures for climate-friendly products are certain, future effects on the climate are not.

Uncertainty relates to various aspects within a consumer's buying decision: Will the product meet his/her expectations? This is particularly difficult to assess in the case of products with credence attributes such as climate-friendly production. From the consumer's perspective it is not certain that the information given with the product, in this case CFP labelling really indicates a more climate-friendly production. This phenomenon usually is covered by the variable trust in labels. Another aspect of uncertainty is the individual perception of the degree to which the own behaviour will change anything. This aspect usually is covered by the variable 'perceived consumer effectiveness' which indicates to which degree a consumer perceives his/her own decisions to have an impact. Compared to other sustainable product attributes climate-friendliness is different with regard to the risk/uncertainty representation: There is not even an agreement among scientists about the future effects of climate change, neither with regard to the magnitude nor to the complexity (van der Linden, 2015). Therefore the perceived probability of offsetting current benefit (e.g. taste, savings in expenditures) without getting any future revenue/benefit might be rather high. Consequently, risk attitudes might be of crucial relevance for the effect of CFP labelling in the markets.

The aim of this contribution is to better understand the factors which influence consumers' purchase behaviour of climate-friendly labelled products with emphasis on knowledge, trust in labels, time preference and uncertainty.

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2 Data and methods

An online survey was conducted with 6007 respondents in six European countries (France, Germany, Italy, Norway, Spain and the UK) in July 2015 (Table 1). In comparison to census data in the six countries, people with higher education (12 or 13 years of school visit, college or university degree) were overrepresented in the sample. Within this survey a questionnaire and Choice Experiments were combined (the results of the Choice Experiments will not be part of this contribution). The questionnaire focused on consumers' attitudes on climate change, their subjective knowledge of climate change, their perceived consumer effectiveness, risk behaviour/attitudes and socio-demographics.

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Table 1: Summary statistics for variables on demographic criteria (%)

	Germany	UK	France	Italy	Spain	Norway
Gender						
Female	49,7%	50,1%	50,8%	50,6%	50,1%	51,4%
Male	50,3%	49,9%	49,2%	49,4%	49,9%	48,6%
Age						
18-29	23,1%	26,9%	25,0%	21,0%	20,9%	22,9%
30-49	40,6%	39,3%	39,5%	44,1%	43,7%	41,0%
50-70	36,4%	33,8%	35,5%	34,9%	35,4%	36,2%
Household size						
1	24,9%	20,7%	20,8%	8,7%	8,5%	27,0%
2	39,5%	32,9%	33,3%	21,4%	23,8%	35,0%
3	17,0%	17,8%	19,0%	29,8%	30,8%	15,5%
4	13,7%	19,9%	18,5%	29,3%	27,3%	14,7%
> 4	4,9%	8,8%	8,5%	10,8%	9,6%	7,8%
Education						
No formal qualification	0,2%	4,2%	2,6%	0,5%	0,8%	0,5%
10 years school visit	48,9%	24,1%	15,6%	15,1%	14,7%	5,7%
12 or 13 years school visit	27,3%	19,5%	34,9%	50,1%	40,3%	35,8%
College/university degree	23,7%	52,2%	46,9%	34,3%	44,2%	58,0%
N	1001	1000	1000	1003	1002	1001

Attitudes with respect to climate change were assessed by using in total 9 statements referring to climate change. The agreement with the statements was measured on a 7 point Likert scale with 1 indicating 'do not agree at all' and 7 'fully agree'. In order to reduce the number of variables a principal component analysis was conducted which rendered the 2 factors 'Concern' and 'Ignorance'. 'Concern' summarises variables which expressed participants' unease with climate change. In contrast, 'Ignorance' embraces statements which indicate little preoccupation with climate change.

Table 2: Results of the principal component analysis on respondents' attitudes towards climate change (factor loadings) [1]

	Concern α=0.865	Ignorance α=0.766
Climate change is a serious problem	0.860	
Climate change is a menace to our future	0.856	
I am concerned about climate change	0.834	
We should burden future generations as less as possible with the consequences of climate change	0.742	
Climate change is a good thing		0.752
Climate change does not exist		0.741
The effects of climate change will not affect me		0.717
All the talk about climate change gets on my nerves		0.658
Future generations will find a solution for the impacts of climate change		0.611

[1] Principal component analysis, varimax rotation

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Test persons' subjective knowledge was measured by their self-assessment with the three items 'Compared to an average person I know a lot about the climate effects of products and services', 'I know a lot about how to evaluate the climate-friendliness of products and services' and 'People who know me, consider me as an expert in the field of climate effects of products and services' (7 point Likert scale: 1 indicating 'do not agree at all' and 7 'fully agree'). The means of the answers to these statements resulted in the scale 'knowledge' (Cronbach's alpha = 0,894).

Perceived consumer effectiveness was addressed by the three statements 'I can reduce the effects of climate change by purchasing climate friendly products', 'Each person's behaviour can contribute to the mitigation of climate change' and 'I think it's a good idea to introduce labels indicating the climate-friendliness of food' (7 point Likert scale: 1 indicating 'do not agree at all' and 7 'fully agree) (Cronbach's alpha = 0,876). The means of the answers to the three statements were calculated and resulted in the new variable 'Perceived consumer effectiveness'.

Similarly, the construct trust in label was elicited by three items 'I am not sure if a product which is marked as climate-friendly is actually better for the climate', 'I do not trust all the different kinds of labels' and 'Labels are just a marketing trick' (7 point Likert scale: 1 indicating 'do not agree at all' and 7 'fully agree). The scales were reversed and resulted in the variable 'trust' with a Cronbach's alpha of 0.811.

Time preference was captured by the two items 'I am already busy enough handling life today. The future does not interest me' and 'I have to get along with what I have. I cannot show consideration for the future' which were averaged into the scale 'time preference' (Cronbach's alpha = 0.71).

Due to the complexity of uncertainty/risk in consumers' decision making for climate-friendly products risk was measured in different ways. First, some proxies for risk attitudes were used such as contribution to a private pension scheme ('I contribute to a private pension scheme') and the willingness to insure against climate changes ('I would like to insure myself against the impacts of global warming (e.g. droughts, storms, floods)'). Second, test persons were asked for an assessment of their own risk attitude ('How do you perceive yourself? Are you in general risk taking or do you try to avoid risks as much as possible?' - 1 'I try to avoid risks as much as possible', 7 'I am very risk taking').

In order to explain test persons' preparedness to buy climate-friendly products a multinomial regression was conducted. Dependent variable was the stated purchase behaviour of climate-friendly products ('Do you already purchase products labelled as climate-friendly?'). Answer possibilities were 'no', 'yes, sometimes' and 'yes, regularly'.

3 Results and discussion

In the very beginning of the interviews the test persons were asked for the importance of different product attributes for their purchasing decision. Most important were the egoistic attributes 'quality/taste' followed by 'price' and 'healthiness' (Figure 1). Altruistic attributes were only ranked afterwards and all at a very similar level with about 15 to 20% of the respondents stating them to be important for their purchasing decisions. These results somehow contradict earlier studies in which climate-friendliness was less important than organic (Gadema and Oglethorpe, 2011).

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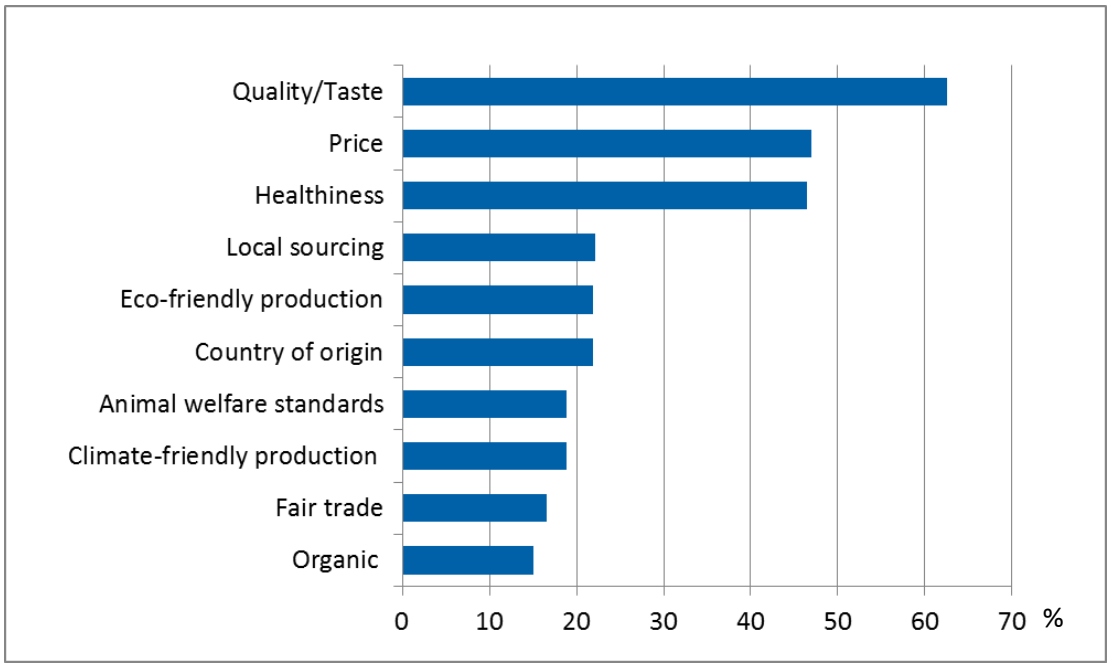
Figure 1: Importance of different product attributes for consumers' purchasing decisions (share of respondents answering 'important')



Question: How important is each of the product attributes in your purchase decision? (1 'not important', 5 'important').

About 13% of all respondents stated to buy climate-friendly products on a regular basis and another 56% to sometimes buy these products (Table 3). These numbers differ markedly between countries, the share of people who stated that they do not buy climate-friendly labelled food being highest in the UK and lowest in Spain.

Table 3: Purchase of climate-friendly products (% of respondents)

	All	DE	ES	FR	IT	NO	UK
Yes, regularly	12.7	8.8	19.2	13.3	18.2	6.4	10.1
Yes, sometimes	55.7	51.8	65.3	55.4	61.8	56.2	43.5
No	31.6	39.4	15.6	31.3	19.9	37.4	46.4

Question: Do you already purchase products labelled as climate-friendly?

Possible reasons for the differences might be different diffusion of climate-friendly labels in the respective national markets and thus different experiences of the test persons as well as different knowledge and awareness of Carbon Footprint labels. E.g. in Italy and Spain no CFP labels existed when the interviews were conducted. The results thus may indicate on the one hand some confusion with regard to CFP labels and on the other hand an intention or preparedness to buy climate-friendly products.

In spite of differences between countries with regard to existing labelling practices we used stated present buying behaviour with regard to climate-friendly labelled food as dependent variable (see Table 3) and ran a multinomial regression analysis to explore the impacts of different variables on consumers' purchase decision

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on climate-friendly labelled food. Differences between countries were captured by introducing dummy variables for each country.

As expected, test persons with better subjective knowledge of the climate impact of products and services had a higher probability of buying climate-friendly products (Table 4). Trust and perceived consumer effectiveness also showed positive impacts. Test persons with higher time preference were less likely to buy climate-friendly products and vice versa. This is in line with theoretical considerations according to which the present saving of money and pleasure gains are valued higher than the possible benefits resulting of less future impacts of climate change. In all these explanatory variables the impact was stronger for test persons who stated to buy climate-friendly products on a regular basis compared to people who indicated to buy climate-friendly products only sometimes.

The impact of the different variables used to catch risk behaviour of test persons was not straightforward. The effect of the risk indicator 'Climate insurance' seems to be highly reasonable: people who would like to insure themselves against the possible impacts of global warming (e.g. droughts, storms, floods) bought climate-friendly products more frequently. Similarly, people who contribute to a private pension scheme more frequently bought climate-friendly products. Both indicators are supposed to point to risk-averse individual behaviour. The variable 'risk taker' acts in another direction: test persons who perceived themselves to be more risk taking showed a higher probability to purchase climate-friendly products. The results of these three different indicators used to measure risk attitudes thus seem to contradict each other. Possibly, different dimensions of risk/uncertainty were addressed by the various indicators.

Table 4: Impact factors on the probability of purchasing climate-friendly products (Multinomial regression, coefficients)

Variable	yes, sometimes	yes, regularly
Knowledge	0.339 ***	0.889 ***
Trust	0.163 ***	0.198 ***
Perceived consumer effectiveness	0.256 ***	0.606 ***
Time preference	-0.094 ***	-0.111 **
Risk behaviour		
Risk taker	0.077 ***	0.174 ***
Private pension (1/0)	0.154 **	0.611 ***
Climate insurance (1/0)	0.542 ***	0.870 ***
Attitudes towards climate change		
Concerned	0.053	-0.010
Ignorant	0.000	0.210 ***
Share of organic food purchases	0.441 ***	0.998 ***
Socio-demographics		
Age (years of age)	0.010 ***	0.007 *
Gender female (1/0)	-0.091	-0.202 *
Country [1)]		
DE (1/0)	-0.386 ***	-0.654 ***
UK (1/0)	-0.706 ***	-0.767 ***
ES (1/0)	0.353 ***	0.440 **
FR (1/0)	-0.020	0.212
IT (1/0)	0.013	0.111
Constant term	17.851 ***	6.149

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1) DE - Germany, UK – United Kingdom, ES - Spain, FR – France, IT – Italy. Reference country Norway.

Test person's attitudes towards climate change did not have an impact as expected. People concerned about climate change did not state to buy CFP-labelled products more frequently and test persons ignorant about climate change even stated to buy CFP labelled products more frequently which is contradictory to what has been expected.

Socio-demographic variables also had some impact on the probability to purchase climate-friendly products, older people more frequently bought this kind of products 'sometimes'. Interestingly, the odds to buy climate-friendly products are significantly lower in Germany and in the UK and higher in Spain compared to the other study countries France, Italy and Norway.

4 Conclusions

The attitude-behaviour gap is an important phenomenon when discussing the consistency of consumer behaviour and/or the validity of empirical consumer research. Research, not only in the field of consumer behaviour but also in environmental psychology, increasingly addresses reasons for this discrepancy, still, no definite solution has been found. Some likely explanations include distrust in labelling, information overload and limited knowledge, availability, budget constraints – all being aspects which challenge consumers in their purchase decisions for ethical products. Further issues are time preference and uncertainty/risk which, according to the authors' knowledge have only rarely been addressed by now with regard to buying behaviour in food. Our results show that these constructs partly explain the gap between people's climate-friendly consciousness and their behaviour as consumers. Time preference has been proven to clearly influence the preparedness to buy climate-friendly products. With regard to the impact of individuals' risk attitudes the results are not as clear. Further research is needed to better define risk components and their specific impact on buying decisions.

When aiming at increasing consumers' demand for climate-friendly products, knowledge and trust in labels could and should be influenced by awareness and information campaigns. People's time preference and risk attitudes cannot be directly addressed by any marketing activity. Instead, it is important to increase knowledge about the impact of consumption behaviour and, by doing this, to reduce the individually perceived uncertainty within the buying decision. In addition, the purchase of climate-friendly products could be encouraged by nudging instruments. The idea is to incentivise low carbon choices by making the choice for a climate-friendly product more comfortable and intuitive for example by product placement or loyalty schemes (Berry et al. 2008).

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