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Sustainable Consumption of Groceries: the Importance of Believing that One Can Contribute to Sustainable Development

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ABSTRACT
This study investigated relations between consumers' sustainable development self-efficacy, attitudes, norms and intentions to purchase sustainable groceries such as ecological and fair trade foods. Demographic variables were also investigated. Attitudes and norms were positively associated with intentions to purchase sustainable products. The importance of different types of attitudes and norms for explaining sustainable consumption depended on the facet of purchasing intentions that was investigated. Self-efficacy explained variance in purchasing intentions over and above attitudes, norms and demographic characteristics. Of the self-efficacy components, people's perceptions of their indirect impact gained by encouraging others to contribute to sustainable development showed the strongest association with purchasing intentions. This could mean that believing that one can have an impact on other consumers is a strong motivator for buying sustainable products. Implications of these findings for practitioners and environmental policy are discussed. © 2016 The Authors Sustainable Development published by ERP Environment and John Wiley & Sons, Ltd

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Introduction

Whereas there is broad consensus that individuals have some responsibility for sustainable development, the question of what motivates consumers to choose environmentally responsible and fair trade products in their everyday shopping has yet to be fully answered (De Pelsmacker and Janssens, 2007). There is evidence that consumer decisions are sometimes made spontaneously and are influenced by situational cues such as displays and sales promotions in stores (Biel *et al.*, 2005; Wansink *et al.*, 1998). However, in the case of purchases that are made on a daily basis, such as the purchasing of groceries, it is likely that product choices are guided by habits (Biel *et al.*, 2005). Although habitual purchases may not involve effortful deliberation

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and the comparison of available options, it is assumed that habits can *originate* from the repetition of deliberate decisions that lead to satisfactory outcomes (cf. Grunert, 2005).

Therefore, psychological theories that conceive of humans as agents and that describe decision making as a deliberate, intentional and goal-directed process can be helpful for understanding how sustainable purchase habits develop. One such theory that has received extensive attention in the literature is the theory of planned behavior (TPB; Ajzen, 1991; Fishbein, 2000; Fishbein and Ajzen, 2010). According to the TPB, a person's intention to carry out a behavior is the main determinant of whether the person will actually show the behavior. The behavioral intention, in turn, is determined by the person's attitude toward the behavior, subjective norm and perceived behavioral control. Attitudes comprise our beliefs about the consequences of performing a behavior and our evaluations of the consequences. Subjective norms refer to our beliefs about what significant others expect us to do and our motivation to comply with these expectations. Finally, perceived behavioral control comprises our beliefs about our ability to perform a behavior. Meta-analyses have found that attitudes, norms and perceived behavioral control explained 55% of the variance in pro-environmental intentions (Klöckner, 2013), and intentions explained on average 27% of the variance in pro-environmental behaviors (Bamberg and Möser, 2007). There is also evidence that the theory has good predictive power with regard to sustainable consumption (Chan and Lau, 2001; Han *et al.*, 2010; Thøgersen, 2006) and the consumption of environmentally responsible (see Aertsens *et al.*, 2009, for an overview; Sparks and Shepherd, 1992) and fair trade groceries (Ozcaglar-Toulouse *et al.*, 2006) in particular.

An individual-level characteristic related to perceived behavioral control is perceived *self-efficacy* (sometimes referred to as *self-efficacy beliefs*). Self-efficacy has been construed differently by different authors. Some use the term to refer to people's perceived ability to carry out a *behavior*. This is how the construct was conceptualized by Bandura (see, e.g., 1977) and how it has been construed in recent variants of the TPB that include the construct of self-efficacy instead of perceived behavioral control (see, e.g., Fishbein and Cappella, 2006). According to this conceptualization, the terms self-efficacy and perceived behavioral control are synonymous. Others conceptualize self-efficacy as having a different focus: instead of referring to people's perceived ability to carry out behaviors, these authors use the term to refer to people's perceived ability to achieve desired *outcomes* through their actions. For example, Kellstedt *et al.* (2008) investigated people's perceived ability to influence climate change through their own actions as well as indirectly by encouraging other people to help mitigate climate change. According to this conceptualization, self-efficacy is similar to the constructs of outcome expectations (Bandura, 1977), referring to the degree to which people believe their efforts will produce favorable versus adverse outcomes, and response efficacy (see, e.g., Floyd *et al.*, 2000), referring to the perceived effectiveness of one's actions. This approach to self-efficacy is prominent in the literature that conceives of sustainability issues as social dilemmas, stressing the fact that contributions by many people are needed to achieve sustainability (see, e.g., Gupta and Ogden, 2009). With regard to the relation between the two aspects of efficacy beliefs, researchers have traditionally hypothesized that beliefs about one's ability to perform a behavior causally affect expected outcomes of the behavior. However, there is empirical evidence indicating that the relation may be reversed (for an overview, see Williams, 2010). Whereas a large body of research has investigated relations between perceived ability and the actual performance of behaviors, outcome expectations have received less attention (Williams, 2010).

The present research used the outcome-directed approach to self-efficacy to investigate the degree to which self-efficacy could explain consumers' intentions to purchase *sustainable groceries*, such as ecologically produced and fair trade foods. More precisely, self-efficacy beliefs were investigated with regard to consumers' perceived ability to contribute to sustainable development. Because sustainable development is a collective effort that requires contributions from many people and interest groups, consumers may believe that their own individual behavior makes little difference (cf. Kerr, 1989, on self-efficacy in large-scale social dilemmas). Doubts about one's self-efficacy may discourage consumers from purchasing sustainable products, especially considering that many sustainable alternatives are more expensive than conventional products. In line with this assumption, previous studies have shown that self-efficacy predicted the purchasing of sustainable foods and cosmetics: consumers with stronger beliefs in their ability to contribute to sustainable development were more likely to purchase sustainable products than consumers with weaker beliefs in their ability to make a difference (Hanss and Böhm, 2010).

Most studies that have investigated people's perceived ability to help solve sustainability issues have focused on the outcome domain of environmental preservation. Examples are the concepts of environmental action internal control (Smith-Sebasto and Fortner, 1994), environmental locus of control (Cleveland *et al.*, 2005) and

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perceived consumer effectiveness (see, e.g., Ellen *et al.*, 1991). Hanss and Böhm (2010) introduced the term *sustainable development self-efficacy* to refer to people's perceived impact on three sustainable development outcome domains: environmental preservation, social fairness and economic welfare. These outcome domains resemble main development goals formulated in Agenda 21 (United Nations, 1992), including the preservation of environmental resources, for example by promoting sustainable agriculture (environmental dimension), and securing higher living standards and a more prosperous future for all, for example by promoting more equitable trading systems (social and economic dimensions). Moreover, the construct comprises perceptions of the direct and indirect impacts that one can have on sustainable development. Direct impact refers to how one's own actions can affect sustainable development, whereas indirect impact refers to encouraging other people to contribute to sustainable development.

The theoretical distinction between direct and indirect perceived impacts has been supported empirically (Hanss and Böhm, 2010, 2013), and both direct and indirect perceived impacts have been found to predict the purchasing of sustainable products. The importance of direct and indirect perceived impacts for predicting sustainable purchases was found to vary between different facets of sustainable consumption; overall, the perceived indirect impact on sustainable development was the better predictor (Hanss and Böhm, 2010).

So far, sustainable development self-efficacy has not been investigated within a broader conceptual framework with regard to its ability to explain sustainable consumption. Therefore, little is known about how well this type of self-efficacy explains sustainable consumption in connection with other variables (with the exception that generalized self-efficacy was included as a covariate in the study by Hanss and Böhm, 2010). The current study contributes to the literature by investigating the degree to which intentions to purchase sustainable products can be explained by attitudes, norms and sustainable development self-efficacy. In addition, we controlled for a number of demographic variables (i.e. age, gender, highest education, family status and household income).

Most studies that have investigated attitudes, norms or self-efficacy together with sustainable consumption have covered one specific field of consumption (e.g. use of public transportation: Heath and Gifford, 2002) or specific products (e.g. organic vegetables: Sparks and Shepherd, 1992). In the present research, we investigated consumers' intentions to purchase sustainable groceries from different product categories (e.g. coffee, fruits, vegetables and animal products) with different sustainable characteristics (e.g. products from certified ecological farming and fair trade products).

Hypotheses

We expected to find the following associations.

> Hypothesis 1. Consumers who hold more favorable attitudes will have stronger intentions to purchase sustainable products than those who hold less favorable attitudes.

> Hypothesis 2. Consumers who perceive stronger norms for purchasing sustainable products will have stronger purchasing intentions than those who perceive norms to be weaker.

> Hypothesis 3a. Consumers who report stronger self-efficacy will have stronger intentions to purchase sustainable products than those who report weaker self-efficacy.

> Hypothesis 3b. Self-efficacy with regard to one's *indirect* impact on sustainable development will be a more important covariate of purchasing intentions than self-efficacy with regard to one's *direct* impact on sustainable development.

No hypothesis was formulated concerning the relative importance of attitudes, norms and self-efficacy for explaining different facets of sustainable consumption. This part of the study was exploratory.

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Method

Participants and Procedure

Participants were 145 residents of the Bergen community (Norway). Ages ranged from 18 to 70 years, and 64% (n = 93) were female. The majority of the participants held a university degree (64%) and were married or had a life partner (63%). Household income (annual income after taxes) was measured with categories; the median income category was NOK 350 000 to NOK 449 000 (approximately $42 000 to $53 000).

Data were collected as part of an intervention study conducted between November 2009 and June 2010 over the Internet. The data reported in this paper were collected on two occasions approximately one week apart and before the intervention was applied (i.e., the data served as baseline measures in the intervention study). Purchasing intentions and self-efficacy were measured on both occasions, and for each construct the data were combined for further analysis. Attitudes, norms and demographic characteristics were measured on only one occasion. A detailed description of the intervention study is provided by Hanss (2012).

Newspaper advertisements and mailbox postings were used to inform people about the study and to recruit participants. It was announced that all participants would receive an incentive worth NOK 500 (approximately $81) for taking part in the study. Those who signed up for the study via a website received an email invitation with a personalized link to the online questionnaire.

Measures

Intentions to Purchase Sustainable Products

The instrument used to measure purchasing intentions included 18 items. Each item consisted of a statement about the purchasing of sustainable products (e.g. food and cosmetics) with different attributes (e.g. fair trade, environmentally responsible production or little packaging). Each statement focused on a specific product category and attribute. The attributes were adopted from a previous study that explored what attributes Norwegian consumers thought were important for sustainable products (Hanss and Böhm, 2012). Example items are provided in Table 1. Participants indicated how likely they were to endorse the statement on an 11-point scale ranging from 0 (*no, definitely not*) to 10 (*yes, definitely*).

A principal component analysis (varimax, eigenvalues greater than one) was performed on the data from the first measurement point (intentions were measured on two occasions; see above). The analysis revealed that three facets of purchasing intentions could be distinguished (explaining 63.75% of the variance; see Hanss and Böhm, 2013, for

Sustainable development outcome domains	Examples of product attributes	Examples of questionnaire items
Environmental preservation	little wrapping, recyclable container, eco-certificate, no animal testing	When I buy wrapped food, I will make sure that the wrapping can be recycled. When I buy fruits and vegetables and have the choice between ecological and conventional products, I will buy ecological products.
Social fairness and economic welfare	fair trade-certificate, farmer-to-consumer direct marketing	When I buy food and have the choice, I will buy products that guarantee fair payment to the producers. When I buy fruits and vegetables, I will go to a farmers' market or a similar place where I can buy directly from the farmer.

Table 1. Sustainable development outcome domains and product attributes included in the measurement of purchasing intentions
In the context of grocery production, trade and purchasing, it is often difficult to separate the sustainable development outcome domains *social fairness* and *economic welfare*. An example is fair trade, which contributes to both a more equitable distribution of resources and improved economic welfare of producers. Therefore, the two outcome domains are displayed together in the table.

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more details). On the basis of this finding, the items were combined into three index variables in the same way for both measurement points. Each index variable was generated by computing the mean score across the items with high loadings on the respective components (the components are described below). The two index variables reflecting the same component across the two points in time were then averaged to form a single index for each facet of the construct. Higher scores on the index variables indicate stronger intentions to purchase sustainable products of the particular type captured by the component. Cronbach's alpha values for the three facets ranged from 0.75 to 0.91.

The first index variable, *PI Seasonal-Domestic*, represents intentions to buy seasonal fruits and vegetables and intentions to buy domestically produced groceries. The second index, *PI Resource-Saving-Ethical*, represents intentions to buy products with a range of product attributes, such as fair payment to producers, humane animal treatment, little and recyclable packaging, and little energy use for production and product transportation. The third index, *PI Ecological Foods*, represents intentions to buy certified ecological foods and intentions to buy foods directly from farmers.

Sustainable Development Self-Efficacy

Twenty-four items were used to measure various aspects of sustainable development self-efficacy: (a) self-efficacy with regard to three outcome domains – environmental preservation, socially fair distribution of resources and economic welfare; (b) self-efficacy with regard to one's direct impact on sustainable development; (c) self-efficacy with regard to one's indirect impact on sustainable development gained by motivating other people to contribute; (d) self-efficacy with regard to promoting sustainable development specifically by buying sustainable products.

Each item consisted of a statement. Example items for measuring self-efficacy with regard to one's direct impact are 'With my everyday consumption and buying behavior I can contribute to a socially fair distribution of resources in this country' and 'By purchasing sustainable (e.g. ecological and fair trade) products, I can encourage more sustainable agricultural practices'. An example item for measuring self-efficacy with regard to indirect impact is 'My actions to contribute to the preservation of natural resources will encourage others to do the same'. Participants answered the items by indicating how much they agreed with each statement on a five-point scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). The items are described in more detail by Hanss and Böhm (2010, 2013).

A PCA (varimax, eigenvalues greater than one) was performed on the data from the first measurement point (self-efficacy was measured on two occasions; see above). The results revealed that five facets of self-efficacy could be distinguished (explaining 77.35% of the variance; see Hanss and Böhm, 2013, for more details). Cronbach's alpha for the five facets ranged from 0.82 to 0.94. Following the same procedure as used to generate the purchasing intention indices, five self-efficacy index variables were generated to represent the five facets. Higher scores on the index variables indicate stronger self-efficacy beliefs.

The first index, *SDSE Environment-Climate*, represents self-efficacy with regard to helping to preserve the environment and mitigate climate change. The second index, *SDSE Sustainable Products*, represents self-efficacy with regard to promoting sustainable development by buying sustainable products. The third index, *SDSE Domestic*, represents self-efficacy with regard to promoting sustainable development in Norway. The fourth index, *SDSE Others*, represents self-efficacy with regard to motivating other people to promote sustainable development (i.e. perceived indirect impact). The fifth index, *SDSE Global*, represents self-efficacy with regard to promoting sustainable development globally.

Attitudes

Eight items adopted from Tanner and Wölfing Kast (2003) were used to measure attitudes toward buying sustainable groceries. The items captured different aspects of sustainable consumption: environmental preservation, health, fair trade and regional production. An example item is 'It is important to me whether the produce was grown organically or conventionally'. In the study by Tanner and Wölfing Kast (2003), this item was negatively formulated, indicating an unfavorable attitude toward purchasing sustainable groceries. We decided to reformulate the item because the remaining seven items were positively formulated, indicating favorable attitudes. Participants indicated how much they agreed with each statement on a five-point scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*).

A PCA (varimax, eigenvalues greater than one) showed that two facets of attitudes could be distinguished (explaining 61% of the variance). The first facet (*Attitudes Regional-Healthy*) captured attitudes concerning the

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purchasing of healthy and regionally produced groceries. The second facet (*Attitudes Ecological-Fair Trade*) captured attitudes concerning the purchasing of ecological and fair trade groceries. For each of the two facets, an index variable was generated by calculating mean scores across the items with high loadings on the respective component. Higher scores on the index variables indicate more favorable attitudes. Cronbach's alpha values were 0.71 and 0.81, respectively.

Norms

Six items adopted from Thøgersen (2006) measured perceived norms, with three items capturing social norms and three items capturing moral norms. The items were slightly adapted to match the focus of this study. For both social and moral norms, the three items referred to the purchasing of ecological, fair trade and regional products, respectively. An example social norm item is 'I believe that most of my acquaintances expect me to buy fair trade instead of conventional products'. Participants indicated how much they agreed with the statement on a five-point scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*).

An example moral norm item is 'From a moral perspective, how right or wrong is it to choose fair trade instead of conventional products?'. Participants answered by rating the statements on a five-point scale ranging from 1 (*very wrong*) to 5 (*very right*).

A PCA (varimax, eigenvalues greater than one) showed that the items capturing social norms made up a different facet than the items capturing moral norms. The two components explained 82% of the variance in norms. Two index variables were generated using the same procedure that was applied to the other constructs. Higher scores on the index variables indicate stronger norms. Cronbach's alpha values were 0.92 (social norms) and 0.84 (moral norms).

Demographic Characteristics

Participants were asked to provide information about their age, gender, highest level of education (lower secondary school, high school or university/higher education) and family status (married/life partner, in a relationship, single). In addition, household income (annual income after taxes) was assessed with eight answer categories: below NOK 150 000, between NOK 150 000 and 249 000, between NOK 250 000 and 349 000, between NOK 350 000 and 449 000, between NOK 450 000 and 549 000, between NOK 550 000 and 649 000, between NOK 650 000 and 749 000, and NOK 750 000 or more. Table 4 (later) shows how the variables were coded.

Results

Means and Standard Deviations

Table 2 displays means and standard deviations for the index variables. Purchasing intentions were strongest for seasonal and domestic products (PI Seasonal-Domestic), followed by resource-saving and ethical products (PI Resource-Saving-Ethical) and ecological foods (PI Ecological Foods).

Participants' attitudes toward sustainable products were generally positive, the purchasing of regional and healthy (Attitudes Regional-Healthy) products being viewed as slightly more positive than the purchasing of ecological and fair trade products (Attitudes Ecological-Fair Trade).

On average, participants thought that the purchasing of ecological, fair trade and regional products was morally right (moral norms). Social pressure to purchase ecological, fair trade and regional products was perceived to be relatively low (social norms).

Participants felt most confident about being able to help protect the environment and mitigate climate change (SDSE Environment-Climate), followed by helping to promote sustainable development by purchasing sustainable products (SDSE Sustainable Products) and promoting sustainable development nationally (SDSE Domestic). SDSE Domestic was not significantly different from the perceived ability to promote sustainable development indirectly (SDSE Others) but stronger than the perceived ability to promote sustainable development globally (SDSE Global).

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Index variable	*M*	SD
PI Seasonal-Domestic	6.35 [a]	1.76
PI Resource-Saving-Ethical	5.42 [b]	1.96
PI Ecological Foods	3.99 [c]	1.96
Attitudes Regional-Healthy	3.44 [a]	0.70
Attitudes Ecological-Fair Trade	3.25 [b]	0.79
Moral norms	3.97	0.72
Social norms	2.11	0.85
SDSE Environment-Climate	3.87 [a]	0.58
SDSE Sustainable Products	3.65 [b]	0.70
SDSE Domestic	3.39 [c]	0.71
SDSE Others	3.32 [c, d]	0.70
SDSE Global	3.21 [d]	0.83

Table 2. Means and standard deviations
Purchasing intentions (PI) were measured on an 11-point rating scale ranging from 0 (*no, definitely not*) to 10 (*yes, definitely*). Attitudes, social norms and sustainable development self-efficacy (SDSE) were measured on five-point rating scales ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Moral norms were measured on five-point rating scales ranging from 1 (*very wrong*) to 5 (*very right*).
Within each category of index variables (PI, attitudes and SDSE), differences in mean ratings were investigated using paired-samples *t* tests, but this was not done for norms because moral norms and social norms were measured on different scales (see above). Means displayed with different superscript letters within a category of index variables were significantly different at $p < 0.01$.

Covariates of Intentions to Purchase Sustainable Groceries

Bivariate correlations between the index variables are shown in Table 3. All attitude, norm and self-efficacy variables were positively and significantly associated with the intentions variables PI Resource-Saving-Ethical and PI Ecological Foods. With PI Seasonal-Domestic, all but two variables, SDSE Domestic and SDSE Global, were significantly correlated. These findings provided first support for Hypothesis 1 (attitudes) and Hypothesis 2 (norms). In addition, the findings provided partial support for Hypothesis 3a (self-efficacy).

PI Resource-Saving-Ethical was most strongly associated with self-efficacy concerning the purchasing of sustainable products, followed by attitudes toward ecological and fair trade products and social norms. The correlates showing the strongest association with PI Ecological Foods were attitudes toward ecological and fair trade foods, attitudes toward regional and healthy foods, and self-efficacy concerning the purchasing of sustainable products. PI Seasonal-Domestic was most strongly associated with attitudes toward regional and healthy products, followed by moral norms and attitudes toward ecological and fair trade products.

Multiple regression analyses were computed to investigate the relative importance of attitudes, norms and self-efficacy for explaining variance in PI after controlling for several demographic variables. Preconditions for performing multiple linear regression analysis were met (linearity, imperfect multicollinearity of predictors, unbounded criterion variable, independent and normally distributed residuals, homoscedasticity). The results of the three analyses are presented in Table 4.

Together, the demographic variables, attitudes, norms and self-efficacy explained about 62% of the variance in intentions to purchase resource-saving and ethical products (PI Resource-Saving-Ethical). The strongest association was found for SDSE Others. Other variables that contributed to explaining variance in this purchasing intention facet were attitudes (both index variables), social norms, SDSE Domestic, SDSE Sustainable Products, household income (stronger intentions among participants with higher incomes; $p < 0.10$) and SDSE Environment-Climate ($p < 0.10$). All associations were in the expected direction with one exception: the perceived ability to foster sustainable development in Norway (SDSE Domestic) was negatively related to PI Resource-Saving Ethical. In other words, those who were more inclined to purchase resource-saving and ethical products were less convinced that they could foster sustainable development in Norway.

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Variable number	1	2	3	4	5	6	7	8	9	10	11	12
1. PI Resource-Saving-Ethical	3.85	2.86	1.72	0.93	0.72	0.90	0.63	0.71	0.51	0.60	0.85	0.58
2. PI Ecological Foods	0.745**	3.84	1.80	0.90	0.68	0.68	0.60	0.51	0.33	0.35	0.62	0.36
3. PI Seasonal-Domestic	0.497**	0.522**	3.09	0.46	0.56	0.47	0.52	0.31	0.19	0.20	0.33	0.18
4. Attitudes Ecological-Fair Trade	0.614**	0.590**	0.339**	0.63	0.28	0.32	0.24	0.22	0.27	0.33	0.30	0.24
5. Attitudes Regional-Healthy	0.523**	0.490**	0.453**	0.502**	0.49	0.21	0.27	0.17	0.15	0.16	0.21	0.13
6. Social norms	0.555**	0.419**	0.317**	0.483**	0.342**	0.73	0.20	0.21	0.15	0.15	0.22	0.20
7. Moral norms	0.461**	0.435**	0.418**	0.426**	0.515**	0.327**	0.52	0.14	0.15	0.16	0.22	0.19
8. SDSE Others	0.518**	0.369**	0.255**	0.403**	0.346**	0.373**	0.304**	0.48	0.34	0.38	0.32	0.23
9. SDSE Domestic	0.379**	0.241**	0.160	0.479**	0.307**	0.272**	0.319**	0.680**	0.51	0.47	0.31	0.26
10. SDSE Global	0.379**	0.218**	0.139	0.502**	0.279**	0.230**	0.285**	0.654**	0.801**	0.69	0.36	0.29
11. SDSE Sustainable Products	0.616**	0.453**	0.269**	0.534**	0.427**	0.381**	0.465**	0.661**	0.632**	0.619**	0.49	0.24
12. SDSE Environment-Climate	0.506**	0.320**	0.174*	0.516**	0.312**	0.409**	0.462**	0.561**	0.637**	0.607**	0.597**	0.34

Table 3. Pearson correlations, covariances and variances of index variables[a]

[a]Pearson correlations are shown below the diagonal; covariances are shown above the diagonal; variances are shown on the diagonal.

*$p < 0.05$.

**$p < 0.01$. Correlations varied in strength, corresponding to small ($r = 0.1$), medium ($r = 0.3$) and large ($r = 0.5$) effect sizes (Cohen, 1988).

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Independent variables	Criterion variables					
	PI Resource-Saving-Ethical		PI Ecological Foods		PI Seasonal-Domestic	
	β[a]	t	β[a]	t	β[a]	t
Constant	−4.76	−3.74**	−4.33	−2.99**	−0.31	−0.20
Age	−0.022	−0.35	−0.187	−2.59*	0.090	1.06
Gender[b]	0.102	1.59	0.169	2.33*	0.125	1.47
Highest education[c]	−0.053	−0.88	−0.009	−0.14	0.016	0.21
Family status[d]	0.057	0.88	0.044	0.60	0.016	0.18
Household income[e]	0.132	1.92†	0.091	1.18	0.108	1.18
Attitudes Ecological-Fair Trade	0.270	3.33**	0.423	4.61**	0.095	0.88
Attitudes Regional-Healthy	0.215	2.79**	0.241	2.76*	0.284	2.77**
Social Norms	0.203	2.83**	0.129	1.58	0.094	0.99
Moral Norms	0.089	1.20	0.195	2.31*	0.304	3.07**
SDSE Others	0.278	2.90**	0.233	2.15*	0.213	1.68†
SDSE Domestic	−0.255	−2.49*	−0.208	−1.80†	−0.097	−0.72
SDSE Global	−0.143	−1.37	−0.116	−0.98	−0.134	−0.96
SDSE Sustainable Products	0.217	2.40*	0.079	0.78	−0.080	−0.67
SDSE Environment-Climate	0.169	1.92†	−0.034	−0.34	−0.049	−0.42
R^2	0.617		0.507		0.324	
F	(14, 120) = 13.80**		(14, 120) = 8.83**		(14, 120) = 4.12**	

Table 4. Purchasing intentions regressed on demographic characteristics, attitudes, norms and self-efficacy
[a]Unstandardized *B* coefficient for constant, standardized beta (β) coefficient for all predictor variables.
[b]Gender was coded 1, female, and 2, male.
[c]Highest education was coded 1 = lower secondary school, 2 = high school, and 3 = university/higher education.
[d]Family status was coded 1 = married/life partner, 2 = in a relationship, and 3 = single.
[e]Household income was coded 1 = below NOK 150 000, 2 = between NOK 150 000 and 249 000, 3 = between NOK 250 000 and 349 000, 4 = between NOK 350 000 and 449 000, 5 = between NOK 450 000 and 549 000, 6 = between NOK 550 000 and 649 000, 7 = between NOK 650 000 and 749 000, and 8 = NOK 750 000 or more.
†$p < 0.10$.
*$p < 0.05$.
**$p < 0.01$.

The regression model with intentions to purchase ecological foods (PI Ecological Foods) explained about 51% of the observed variance. The strongest association was found for attitudes toward ecological and fair trade products. In addition, age (younger people reported stronger intentions), gender (male participants reported stronger intentions than female participants), Attitudes Regional-Healthy, moral norms, SDSE Others (all positive associations) and SDSE Domestic (negative association, $p < 0.10$) contributed to explaining this facet of purchasing intentions.

In the model with intentions to purchase seasonal and domestic products (PI Seasonal-Domestic) as the dependent variable (explaining 32% of the variance), moral norms had the strongest association (positive). In addition, Attitudes Regional-Healthy (positive association) and SDSE Others (positive association, $p < 0.10$) accounted for a significant part of the variance.

In conclusion, the regression analyses showed that attitudes, norms and self-efficacy all contributed to explaining intentions to purchase sustainable groceries. However, the relative importance of the independent variables depended on which facet of purchasing intentions was investigated. In support of Hypotheses 1 and 2, attitudes and norms were positively associated with all three facets of purchasing intentions, albeit not all types of attitudes and norms with all intention facets. For Hypothesis 3a, the findings were mixed: it was clearly supported for SDSE Others, which was positively related to all three intention facets. SDSE Sustainable Products and SDSE Environment-Climate were both associated with one of the intention facets, namely PI Resource-Saving Ethical, also supporting Hypothesis 3a. However, the negative associations of SDSE Domestic with PI Resource-Saving-Ethical

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and PI Ecological Foods went against our expectations. Moreover, we found several associations that were not significant: SDSE Global, for example, was not significantly related to any of the purchasing intention facets.

Hypothesis 3b predicted that self-efficacy with regard to one's indirect impact on sustainable development would be a more important covariate of intentions than self-efficacy with regard to one's direct impact on sustainable development. Support for this hypothesis came from the result that SDSE Others had the largest regression weight of all self-efficacy facets in all three regression models (cf. higher β values in Table 4 for all three intention facets).

Discussion

This study investigated the extent to which demographic characteristics, attitudes, norms and self-efficacy taken together could explain variability in consumer intentions to purchase sustainable groceries. As for self-efficacy, we investigated domain-specific sustainable development self-efficacy – a construct that we had previously shown to be associated with sustainable consumption (Hanss and Böhm, 2010). In the current study, we investigated this construct within a broader framework than before and included a wider range of covariates.

Together, demographic characteristics, attitudes, norms and self-efficacy explained between 32% and 62% of the variance in purchasing intentions, findings that are within the range of what has been found in previous studies that have investigated pro-environmental intentions. For example, one meta-analysis found that, on average, 52% of the variance in pro-environmental intentions was explained by attitudes, norms and perceived behavioral control/self-efficacy beliefs (Bamberg and Möser, 2007). Although many everyday purchasing decisions may be guided by habits (Biel *et al.*, 2005), our findings indicate that cognitions assumed to play a role in deliberate decision making distinguish between consumers with stronger and those with weaker preferences for sustainable groceries. A possible explanation is that consumption habits can develop from deliberate purchasing decisions (see introduction).

Previous studies that drew upon the TPB framework to investigate sustainable food consumption measured control beliefs with a focus on consumers' perceived ability to carry out behaviors (e.g. eating organic vegetables; Sparks and Shepherd, 1992). Sustainable development self-efficacy has a different focus as it captures people's perceived ability to contribute to sustainable development *outcome* domains. The present study indicates that this conceptualization of self-efficacy, focusing on control over outcomes, may be helpful for understanding why some consumers purchase sustainable products and others do not. Decisions to purchase sustainable products may depend on not only whether one believes that one has control over the specific behavior (e.g. whether a person thinks he/she can identify environmentally responsible product alternatives in the store) but also on whether one believes that one's purchasing decisions will have an impact on sustainable development. This study is the first to show that sustainable development self-efficacy explains variance in intentions over and above the variance explained by consumers' attitudes and norms.

Beliefs in one's ability to make a difference may be particularly important if the desired outcome is a collective effort that requires contributions from many people. The fact that sustainable development is a collective effort may explain why the component of self-efficacy representing *indirect* impact (i.e. SDSE Others) showed the strongest association with intentions of the different self-efficacy components. This finding corroborates findings from a previous study (Hanss and Böhm, 2010) and could mean that believing in the social impact of one's own purchases of sustainable products is one of the individual-level factors that motivate people to consume sustainably. Experimental research is required to test this assumption.

Different explanations have been proposed for how purchasing decisions can influence the product choices of other consumers. In many everyday situations, purchasing decisions are visible to others (e.g. when choosing products from a counter in a grocery store), and in such situations observed product choices may be perceived as *social defaults* and mimicked by other consumers without further deliberation. A recent study (Huh *et al.*, 2014) showed that social default effects occur when consumers are uncertain about their product preferences (e.g. when choosing between unknown brands; Experiment 3) and when product choices are made under high time pressure (Experiment 5) or high cognitive load (Experiment 6). However, imitation of other consumers' product choices may also result from deliberate processes. For example, consumers may infer from their observations what others normally

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do (descriptive social norm) and/or expect them to do (injunctive social norm), and then act accordingly. Previous research indicates that social norms can influence decisions to contribute to pro-environmental causes (see, e.g., Goldstein *et al.*, 2008; Howell *et al.*, 2014; Liu *et al.*, 2012). A possible explanation is that observations of other people's behaviors are interpreted in terms of social rules regarding what one ought to do in a given situation (Biel and Thøgersen, 2007). Moreover, observing that other people contribute to a common cause (e.g. environmental preservation) may increase trust in the cooperative intentions of others (cf. Parks *et al.*, 2013), strengthen beliefs in the attainment of the desired outcome (e.g. an intact environment) and hence increase people's willingness to contribute their share. The present study showed that social norms were positively associated with PI Resource-Saving-Ethical. However, social norms were not associated with the two other purchasing intention facets (regression analyses). Interestingly, PI Ecological Foods and PI Seasonal-Domestic were positively associated with moral norms, whereas PI Resource-Saving-Ethical was not. This indicates that in decisions to purchase ecological foods and seasonal and domestic foods, one's beliefs regarding what is morally right or morally wrong may be more important than considerations regarding what people in one's social environment expect one to do.

Components of self-efficacy that represent *direct* impacts on sustainable development were less important than SDSE Others for explaining purchasing intentions (regression analyses). For PI Resource-Saving Ethical, significant associations were found for SDSE Domestic, SDSE Sustainable Products and SDSE Environment-Climate. In addition, SDSE Domestic was associated with PI Ecological Foods. Whereas the positive relations found for SDSE Sustainable Products and SDSE Environment-Climate were in accordance with our predictions, we were surprised to find that the associations between SDSE Domestic and purchasing intentions were *negative* in the regression analyses, because SDSE Domestic was positively associated with all intention facets in the bivariate correlations. We can only speculate about the reasons for this reversal in sign. It is possible that it indicates that people see sustainable development as a global issue, so that the less they believe that sustainability can be attained locally, the more they are inclined to purchase products that save collective resources or support ethical causes; maybe it takes controlling for the other predictors to reveal this relation. However, this interpretation is highly speculative. Future research will have to determine whether the negative sign is stable and what the mechanisms are.

SDSE Global was not associated with any of the purchasing intention facets in the regression analyses. Perhaps people's perceived ability to globally contribute to sustainable development would have been more important for explaining sustainable consumption if our measure of purchasing intentions had included more examples of behaviors that affect the state of the environment and the living conditions of people in other parts of the world. For example, only one item explicitly addressed the purchasing of fair trade products; two more items dealt with the purchasing of imported products and products that guarantee fair payment to producers.

With regard to attitudes, a general finding of the present study is that consumers holding more positive views of sustainable groceries also reported stronger intentions to purchase such products. This finding is in line with previous studies that have shown that attitudes are an important predictor of environmental behavior (e.g. Kaiser and Gutscher, 2003) and theories that ascribe attitudes an important role in determining intentions and, indirectly, behavior (e.g. TPB; Ajzen, 1991). One facet of intentions, PI Seasonal-Domestic, was associated with Attitudes Regional-Healthy but not with Attitudes Ecological-Fair Trade in the regression analysis. A plausible explanation for this finding is that consumers' views on regional products have a stronger impact on whether they plan to purchase domestic products than their views on ecological and fair trade products. It has been claimed that Norwegian consumers show high levels of trust in political bodies and consumer organizations when it comes to securing food safety and quality (Terragni and Kjærnes, 2005). Trust in food safety and quality may be particularly high concerning domestically produced products. Support for this notion comes from a study showing that Norwegian consumers preferred domestically produced over imported foods and considered foods with a Norwegian origin to be safer than imported ones (Berg *et al.*, 2005).

Previous studies have found that demographic characteristics (e.g. age, gender, education and household income) could be used to distinguish between consumers who purchase sustainable products and those who do not (see, e.g., Gilg *et al.*, 2005). The present study showed that, if other individual-level variables are controlled for, demographic characteristics are less important for explaining sustainable consumption. This finding is in accordance with the assumption that demographics constitute background variables of different types of belief, which constitute the main determinants of behavioral intentions (i.e. attitudes, norms and self-efficacy; see, e.g., Fishbein and Ajzen, 2010; Fishbein and Cappella, 2006).

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Limitations and Recommendations for Future Research

This study has some limitations that should be addressed in future research. Because the data were cross-sectional, no conclusions can be drawn with regard to directionality in the relations found. For example, positive attitudes toward ecological products (e.g. that ecological products are of high quality) may motivate decisions to purchase ecological products. However, experiences with purchased ecological products may also affect consumers' attitudes toward the products.

Another limitation is that the instrument used to measure attitudes did not match how attitudes are conceptualized in the TPB framework. Ajzen (2006) assumes that attitudes toward a behavior are comprised of two components: (a) beliefs about the outcomes and attributes of the behavior and (b) people's evaluations of these outcomes and attributes. Future studies should consider using instruments that allow these two components of attitudes to be measured more systematically (cf. Ajzen, n.d).

The present study measured self-efficacy with regard to people's direct and indirect perceived impacts on sustainable development. In line with previous findings, the perceived indirect impact, through motivating other people, was an important covariate of sustainable consumption. We have argued that this may be due to the fact that sustainable consumption is a collective effort that requires contributions from many people. In situations in which a desired outcome depends on the behaviors of many people, another type of efficacy belief may be important for motivating individual action: a person's belief in the ability of the collective to achieve desired outcomes. This type of efficacy belief is commonly referred to as *collective efficacy* (Homburg and Stolberg, 2006) and has been found to be associated with environmentally relevant behaviors (see, e.g., Thaker, 2012). Future studies should include measures of collective efficacy and investigate the relative contribution of this type of efficacy belief toward explaining sustainable consumption.

Future studies should include measures of purchasing behavior. Although purchasing intentions tend to be good predictors of purchasing behavior (Hanss and Böhm, 2013), situational (e.g. availability of products) or individual factors (e.g. conflicting interests, changing preferences) may mean that an initially planned behavior is later not carried out. Moreover, while attitudes tend to be good predictors of behavior intentions, associations between attitudes and actual behavior tend to be weaker (Bamberg and Möser, 2007). This common finding has been referred to as *attitude–behavior gap* in the literature (e.g. Young *et al.*, 2010).

Last, data were collected in Bergen, western Norway, and, thus, the findings may not be representative for other regions in Norway or Europe. Therefore, future studies should use larger representative samples of the Norwegian population or of a greater European public.

We believe that, despite these limitations, the present study makes an important contribution to the existing literature. It is among the first studies to investigate sustainable development self-efficacy together with attitudes and norms and to explore the relative importance of these variables in explaining different facets of sustainable consumption. The findings increase our understanding of what characterizes consumers who are willing to xpurchase sustainable products and are therefore valuable for practitioners who are promoting sustainable consumption. An important topic for future research is to investigate how the covariates of sustainable consumption investigated in this study can be strengthened and whether this will increase consumers' willingness to purchase sustainable products.

Implications for Practitioners and Environmental Policy

Initiatives to promote sustainable development often address the public's attitude toward environmental issues such as climate change. The effectiveness of such initiatives may be limited given that the public's attitude toward the environment is already positive in many industrialized countries. For example, the 2014 Special Eurobarometer 416 revealed that 95% of European citizens perceive protecting the environment as personally important (European Commission, 2014, Question QA1). However, these positive environmental attitudes do not always translate into action. While a majority of European citizens participate in recycling (72%), only 21% said they had bought products marked with an environmental label during the previous month (European Commission, 2014, Question QA11).

The present findings suggest that campaigns addressing norms and self-efficacy beliefs may help close the gap between people's environmental attitudes and behaviors. Emphasizing the possible social influence of one's actions

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may be particularly effective for encouraging individual contributions to sustainable development. Empirical support for this assumption comes from the present finding that people's perceived indirect impact on sustainable development (SDSE Others) was a good predictor of purchasing intentions. Moreover, a previous study suggests that providing information about how individuals can encourage other people in their personal surroundings to contribute to sustainable development may promote the purchasing of sustainable products (Hanss and Böhm, 2013). In order to fully understand the potential of such campaigns, the effectiveness of communicating individuals' social influences needs to be further investigated in both laboratory and field experiments.

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