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# **Integrating the Theory of Planned Behavior and the Norm-Activation Theory to Explain Pro-environmental Buying Behavior**

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# **Integrating the Theory of Planned Behavior and the Norm-Activation Theory to Explain Pro-environmental Buying Behavior**

## **ABSTRACT**

Environmental concerns have become a major issue for both organizations and individuals. Therefore, pro-environmental behavior has increased in importance. In this article, we argue that pro-environmental buying behavior is different from regular buying behavior, because it involves a moral component. To explain this type of behavior, it is therefore necessary to integrate two existing theories: the TPB and the norm-activation theory. We test a model explaining the intention to purchase at a sustainably supplied store and find partial support for an integrated model. The intention to purchase is explained by attitude, subjective norm, personal norms, ascription of responsibility and awareness of consequences. Theoretical and managerial implications are provided.

## INTRODUCTION

Environmental issues have become a major concern for both governments as well as organizations (Berrone and Gomez-Mejia, 2009). The feeling that ‘something has to change’ in order to stop the exploitation of natural resources and climate change has become widespread and has created momentum for all kinds of sustainability initiatives. In 2009, world leaders gathered together to talk about climate change at the United Nations Climate Change Conference in Copenhagen and the theme of World Expo 2010 is ‘Better City, Better Life’, “representing the common wish of the whole humankind for a better living in future urban environments” (Expo 2010 website).

Not only organizations, but also individuals have become more concerned about sustainability aspects (De Ruyter, De Jong, & Wetzels, 2009). Customers require companies to pay attention to social and environmental facets alongside the traditional economic aim of making profit, also known as the triple P: People, Planet, Profit (Quak and De Koster, 2007). For example, as a result of increased environmental concern, electric and hybrid cars become increasingly popular among consumers. To fulfill customer demand, the car industry is now forced to invest in the development of such cars, while they were not eager to do so before. Another example is consumers who put their banks under pressure to make ‘green’ and sustainable investments instead of investments in fossil fuels, the arms industry or corrupt regimes. After a website had been launched displaying investment behavior of banks in the Netherlands, tens of thousands of customers undertook action and many actually switched to another, more sustainable bank. The question we pose in this article is: which factors explain consumers’ sustainability-driven buying behavior?

We argue that buying behavior driven by sustainability is different from ‘regular’ (non-sustainability driven) buying behavior. Specifically, we posit that such behavior involves a moral component which should be taken into consideration by management researchers and practitioners. While consumers buy goods or services to maximize utility to the self, they also feel an intrinsic motivation not to harm the environment or other people (Thøgersen, 1999). Behavior focused on taking into account the environmental aspect of sustainability has been referred to as pro-environmental behavior (Van Birgelen, Semeijn, & Keicher, 2009), environment-friendly behavior (Thøgersen, 1999) or environmentally significant behavior (Wall, Devine-Wright, & Mill, 2007), among others. Stern (2000: 408) defined pro-environmental behavior as “behavior that is undertaken with the intention to change (normally, to benefit) the environment”.

Since pro-environmental buying behavior seems different from regular buying behavior in the sense that there is a moral component involved, we argue that we need to extend existing theories to be able to explain this phenomenon. The purpose of this article is to develop and empirically test a model explaining pro-environmental buying behavior, which for the purpose of this study is conceptualized as consumers’ intentions to purchase at a sustainably supplied store.

The amount of research on pro-environmental behavior is already quite extensive (see for example Bamberg, Hunecke and Blöbaum (2007) on the use of public transportation instead of cars, Black, Stern and Elworth (1985) on household energy savings, and Cheung, Chan, and Wong (1999) on wastepaper recycling). However, the theories that have been used to explain this kind of behavior have mostly been limited to either Ajzen’s (1991) Theory of Planned Behavior (TPB) or Schwartz’ (1968a; 1968b) norm-activation theory (also referred to as theory of altruistic behavior). Both theories have proven their usefulness in explaining behavior. The TPB

proposes that a person's behavior can be explained by his or her behavioral intentions and perceived behavioral control. In turn, a person's behavioral intentions can be explained by that person's attitude toward performing the behavior in question, the subjective norm held by reference persons, and perceived behavioral control (e.g., Cheung et al., 1999; Heath & Gifford, 2002). However, a factor that seems missing when applying the TPB to the domain of pro-environmental buying behavior is the moral obligation or personal norms that an individual might have with regard to performing the specific behavior (Bamberg & Schmidt, 2003). Therefore, a number of researchers used Schwartz' (1968a; 1968b) norm activation theory to explain pro-environmental behavior, because this theory specifically focuses on the role of personal norms in influencing (altruistic) behavior (Stern, Dietz, & Black, 1985-1986). However, the norm-activation theory does not take into account any of the factors included in the TPB. In this article, we argue that we need to integrate both theories in order to adequately explain pro-environmental behavior, because a person may have both altruistic and non-altruistic motives for this type of behavior (Wall et al., 2007). Each theory contains unique constructs that might influence this behavior (Bamberg & Schmidt, 2003).

There are a few studies that have built on both the TPB and the norm-activation theory to explain pro-environmental behavior or behavioral intentions (Bamberg et al., 2007; Bamberg & Schmidt, 2003; Harland, Staats, & Wilke, 1999; Oom Do Valle, Rebelo, Reis, & Menezes, 2005; Thøgersen, 1999; Wall et al., 2007). The results from these studies with regard to the factors explaining this type of behavior are mixed. Moreover, none of the articles actually combined both theories in their original and complete format, including the moderating effects of ascription of responsibility and awareness of consequences on the relationship between personal norms and behavior as proposed by Schwartz (1968a; 1968b). By integrating the two theories in their

original and complete format into a new model aimed at explaining pro-environmental purchase intentions, more valid conclusions can be drawn about (1) which factors explain pro-environmental (buying) behavior, and (2) in what way the theories can complement each other. We thereby contribute to the research fields of both consumer buying behavior as well as pro-environmental behavior.

The article is structured as follows. We first provide a theoretical framework of the TPB and the norm-activation theory, which we use to develop our hypotheses. On the basis of consumer data, we empirically test the hypotheses by using structural equations modeling. Subsequently, we present and discuss our findings and conclude with theoretical and managerial implications.

## **THEORETICAL FRAMEWORK AND HYPOTHESES**

### **Pro-environmental behavior**

We conceptualized pro-environmental behavior in this study as consumers' intention to purchase at a sustainably supplied store. By a sustainably supplied store we mean a store that participates in an initiative aimed at reducing the amount of freight traffic in a city centre. For example, in the city in which we conducted our survey, an initiative was started (in April, 2008) to consolidate goods (meant for different retailers in the city centre and delivered by multiple suppliers and logistics companies) in a distribution center just outside the city centre. After the goods have been consolidated, one truck, instead of many, operating on natural gas, enters the city centre and delivers the goods to the retailers. Retailers can choose whether they want to participate or not. The initiative's aim is to reduce the amount of freight traffic in the city centre and thereby to improve the quality of life, air quality and attractiveness of the city centre for people shopping there. The initiative can be considered as sustainable, since it strongly focuses

on the social and environmental aspects next to the economic dimension of supplying retail stores. A few stores have started to communicate their participation in the initiative to consumers, for example by stickers on their windows. In that case, consumers can form specific intentions to purchase goods in these stores instead of in stores that do not participate, thereby supporting the participating stores in their sustainable behavior and also showing pro-environmental behavior themselves. This kind of behavioral intentions can be said to be comparable to consumers' intentions to purchase organic food, fair trade products or products with environment-friendly packaging (Van Birgelen et al., 2009; Thøgersen, 1999).

### **Theory of Planned Behavior**

The Theory of Planned Behavior is an extension of the Theory of Reasoned Action (TRA) (Ajzen & Fishbein, 1969) and proposes that overt behavior can accurately be explained by a combination of behavioral intentions and perceived behavioral control (Ajzen, 1991; 2002). To obtain a high correlation between intentions and behavior, the researcher needs to select intentions that are specific to the behavior under study. The addition of perceived behavioral control next to intentions as a factor influencing behavior has been a reaction to criticism on the original TRA, in which intentions were the only factor directly influencing behavior. The original TRA was limited in dealing with situations not entirely under people's volitional control (Ajzen, 1991). Therefore, perceived behavior control being defined as "the perceived ease or difficulty of performing the behavior" (Ajzen, 1991: 188) was added as a direct influence on behavior. The greater the perceived behavioral control, the more likely that the behavior will take place.



Behavioral intentions, in turn, are determined by three constructs: attitude toward the act, subjective norm and perceived behavioral control. Attitude toward the act can be defined as “the degree to which a person has a favorable or unfavorable evaluation or appraisal of the behavior in question” and subjective norm refers to “the perceived social pressure to perform or not to perform the behavior” (Ajzen, 1991: 188). In general, it is proposed that the more favorable the attitude and subjective norm with regard to a specific behavior, and the greater the perceived behavioral control, the stronger a person’s intention to perform that behavior (Heath and Gifford, 2002; Parker, Manstead, Stradling, Reason, & Baxter, 1992; Smith, Terry, Manstead, Louis, Kotterman, & Wolfs, 2008).

In the field of pro-environmental behavior extensive support for the TPB can be found. The TPB has been successfully used to explain, for example, ecological purchase and disposal decisions (Van Birgelen et al., 2009), wastepaper recycling (Cheung et al., 1999), tin recycling (Kok & Siero, 1985), recycling in general (Oom Do Valle et al., 2005), drivers’ intentions to reduce or maintain their car use for commuting (Wall et al., 2007), the decision to use public transportation instead of a car (Bamberg et al., 2007), and using energy-saving light bulbs (Harland et al., 1999). In line with these studies and based on the TPB, we formulate the following hypotheses:

*Hypothesis 1. The more favorable the attitude toward purchasing at a sustainably supplied store, the stronger an individual’s intention to purchase at a sustainably supplied store.*

*Hypothesis 2. The more favorable the subjective norm toward purchasing at a sustainably supplied store, the stronger an individual's intention to purchase at a sustainably supplied store.*

*Hypothesis 3. The greater the perceived behavioral control over purchasing at a sustainably supplied store, the stronger an individual's intention to purchase at a sustainably supplied store.*

### **Norm-Activation Theory**

The norm-activation theory (Schwartz, 1968a; 1968b) proposes that personal or moral norms only influence behavior if a person defines a situation as a moral choice situation. For a situation to be defined as a moral choice situation, two conditions are necessary: (1) the person must have some awareness that his or her potential acts may have consequences for the welfare of others (awareness of consequences (AC)), and (2) the person must ascribe some responsibility for these acts and their consequences to him- or herself (ascription of responsibility (AR)) (Schwartz, 1968b). Only if these conditions are met, a person's relevant moral norms will be activated and they will have an impact on behavior. Personal norms are conceptualized as feelings of moral obligation to perform specific (altruistic) behaviors and they are based on an internalized structure of values (Schwartz & Howard, 1980). In Schwartz' theory, awareness of consequences and ascription of responsibility are both considered as individual tendencies. Some people tend to become aware of consequences of their potential acts for others and some people do not. The same holds for ascription of responsibility: some people tend to accept responsibility and some people tend to deny responsibility (in general). Personal norms correlate with behavior for people

who score high on AC and AR, but not for people who score low on these tendencies (Schwartz, 1968b; Schwartz & Howard, 1984).

Schwartz (1968a; 1968b) originally applied his theory (also known as the theory of altruistic behavior) to interpersonal behavior. In his study focused on explaining people's considerateness, reliability and helpfulness, he found support for a direct main effect of AR on behavior, a moderating effect of AR on the personal norm-behavior relationship, and a moderating effect of both AR and AC (in interaction) on the personal norm-behavior relationship (Schwartz, 1968a). In another study in which the same nine incidents were researched, he found support for a direct main effect of AC on behavior and a moderating effect of AC on the personal norms-behavior relationship (Schwartz, 1968b). These findings were (partly) replicated in many studies on altruistic behavior, for example on bystander aid to a seizure victim (Schwartz & Clausen, 1970), medical transplant donation (Schwartz & Tessler, 1972), volunteering to be a bone marrow transplant donor (Schwartz, 1973), volunteering to man a booth and sell products to raise money for a good cause (Schwartz, 1974), blood donations (Zuckerman & Reis, 1978), and reading texts unavailable in braille to blind children (Schwartz & Howard, 1980).

Although pro-environmental behavior is not interpersonal behavior, it can be argued that the theory of altruistic behavior can also be applied here. Pro-environmental behavior often involves the sacrifice of immediate, individual benefits for 'the greater good', being the environment. The benefits of a better environment are shared by all people. By acting in a pro-environmental way, people subordinate their individual needs to the needs of the whole population, thereby showing altruistic behavior (Harland et al., 1999).

An important difference between the original norm-activation theory and the form in which it was applied to pro-environmental behavior lies in the way awareness of consequences and

ascription of responsibility are conceptualized. In the original theory they are seen as general tendencies, while in the context of pro-environmental behavior they are conceptualized as behavior-specific. Thus, to what extent are people aware of the consequences of (not) behaving in a pro-environmental way and to what extent do they feel responsible for (not) showing this behavior (e.g., Wall et al., 2007).

There are many studies that found (partial) support for the norm-activation theory in the context of pro-environmental behavior. For example, Hopper and McCarl Nielsen (1991) studied the role of personal norms and awareness of consequences in recycling behavior and their findings support the relationships proposed by Schwartz (1968b). Harland et al. (1999) conclude that personal norms influence five behavioral intentions and four behaviors, being the use of unbleached paper, the use of other transport forms than a car, the use of energy-saving light bulbs and turning off faucet while brushing teeth. Wall et al. (2007) found support for main effects of personal norms and awareness of consequences on driver's car-use intentions and Thøgersen's (1999) results are that personal norms influence consumers' choice of environment-friendly packaging in the supermarket. Further evidence was provided by Heath and Gifford (2002), Bamberg and Schmidt (2003) and Bamberg et al. (2007).

### **Combination of the Theory of Planned Behavior and Norm-Activation Theory**

There are a few studies that combined parts of the norm-activation theory with the TPB, mainly focusing on the addition of personal norms next to attitude toward the act, subjective norm and perceived behavioral control (Bamberg & Schmidt, 2003; Harland et al., 1999; Oom Do Valle et al., 2005; Thøgersen, 1999; Bamberg et al., 2007; Wall et al., 2007). All of them, with the exception of Bamberg and Schmidt (2003), conclude that personal norms explain an

additional amount of variance in behavior or behavioral intentions, next to the constructs of the TPB. There have been no studies, however, which integrate all constructs and relationships as proposed by the norm-activation theory (including the moderating effects of awareness of consequences and ascription of responsibility) with the TPB. We argue that in order to draw valid conclusions about the value of integrating the two theories for explaining pro-environmental behavior, we need to fully take into account both theories. As a consequence, based on the norm-activation theory and the evidence provided by studies in the context of pro-environmental behavior, we also formulate the following hypotheses on (1) main effects of personal norms, ascription of responsibility and awareness of consequences on purchase intention and (2) moderating effects of ascription of responsibility and awareness of consequences on the personal norms-purchase intention relationship (in line with e.g., Schwartz, 1968a; 1968b).

*Hypothesis 4. The stronger the personal norm to purchase at a sustainably supplied store, the stronger an individual's intention to purchase at a sustainably supplied store.*

*Hypothesis 5. The stronger the ascription of responsibility to the self, the stronger an individual's intention to purchase at a sustainably supplied store.*

*Hypothesis 6. The higher the awareness of consequences, the stronger an individual's intention to purchase at a sustainably supplied store.*

*Hypothesis 7. The positive relationship between personal norms and intention to purchase at a sustainably supplied store is strengthened by (a) ascription of responsibility, and (b) awareness of consequences.*

## **EMPIRICAL STUDY**

### **Sample and Data Collection**

We surveyed 313 consumers in a shopping street in the centre of a medium-sized city in the Netherlands. During three days in July 2009, two researchers randomly asked people who were passing by whether they wanted to fill out a questionnaire. People who agreed received a questionnaire (on paper) and were asked to fill it out. On average, it took them about 15 minutes to complete. The questionnaire was in Dutch. Respondents who did not completely fill out the questionnaire were removed from the sample (except for respondents who only did not provide an answer to the household income question (13%), since this question was not crucial for testing our hypothesized model), resulting in 272 respondents who completed the survey.

The majority of the sample are women (62%) and the respondents are quite evenly distributed across the age categories: 18 years or younger: 7%, 19-25 years: 31%, 26-35 years: 21%, 36-45 years: 11%, 46-65 years: 24%, and older than 65 years: 6%. With regard to education we can say that 56% of the respondents completed higher education (university or higher vocational education). Finally, 43% of the respondents reported a net household income of less than 2,000 euro per month, 21% reported an income between 2,000 and 3,000 euro, and 22% above 3,000 euro (13% missing).

### **Questionnaire Development**

*Intention to purchase at a sustainably supplied store.* As dependent variable we used consumers' intention to purchase at a sustainably supplied store. To check whether the respondents saw the initiative in which the stores participated indeed as sustainable, we provided a short description of the initiative in the questionnaire and asked them to rate it on four five-point semantic differential scales. The results were that the respondents saw the initiative as good for the environment (mean: 4.12), leading to less freight traffic in the city centre (4.44), improving the quality of life (4.12), and making shopping in the city centre more pleasant (3.81). Since these results point out that the initiative is seen as sustainable by the respondents, it is valid to use the term sustainably supplied stores for stores that participate in this initiative.

Our study aims at explaining why consumers have the intention to go to a store that is supplied in a sustainable way. However, before consumers will take into account the way in which a store is supplied when considering where to buy a product, some other factors might need to be satisfied. For example, some consumers only look at the price of the product they want to buy. They go to the store with the cheapest offer. Unless the sustainably supplied store is also the store with the lowest price, these consumers will probably not go to the sustainably supplied store. This reasoning is in line with Van Birgelen et al. (2009) who tested a model of ecological product choice (products with ecological packaging). Before they analyzed their model based on the Theory of Planned Behavior, they tested which product characteristics had to be satisfied before consumers would behave in a 'green' way with regard to purchasing of packages. To test whether the way in which a store is supplied is relevant for a consumer choosing a store from which to buy a product, we asked our respondents which store characteristics they would be willing to sacrifice in exchange for a sustainable store supply. The store characteristics we took into account were price, location, service level, advertisements, atmosphere, assortment, store

personnel (friendliness), and sales promotions (Ghosh, 1994). The majority of the respondents (79%) would not go to a sustainably supplied store if the personnel were less friendly than in a store that was not supplied in a sustainable way, the service level were lower (74%), the assortment were not as good (70%), the atmosphere were less pleasant (57%), or if the sales promotions were less attractive (55%). A majority of the respondents *would* go to a sustainably supplied store despite a less convenient location (63%), somewhat higher prices (69%), or less attractive advertisements (77%). It can be concluded that a majority of the consumers would be willing to sacrifice on location, prices and advertisements in order to purchase at a sustainably supplied store. Store personnel, service level, assortment, atmosphere and promotions, however, should be of the same quality as non-sustainably supplied stores, otherwise consumers would not buy at the sustainably supplied store.

We measured intention to purchase at a sustainably supplied store by a 3 item 5-point Likert scale based on Bloemer and De Ruyter (2002), who measured the intended behavior toward adopting a green insurance. The scale ranged from ‘totally disagree’ to ‘totally agree’.

***TPB constructs.*** Attitude towards purchasing at a sustainably supplied store was measured on a 3 item 5-point semantic differential based on Ajzen and Fishbein (1970) (‘bad’ – ‘good’, ‘foolish’ – ‘wise’) and Harland et al. (1999) (‘negative’ – ‘positive’). To measure perceived behavioral control, we used two items from Cheung et al. (1999) and added one item that we formulated based on Ajzen’s (1991) conceptualization of perceived behavioral control as the number of obstacles or impediments individuals anticipate with regard to performing the behavior. Subjective norm was measured with three items taken from Smith et al. (2008). Both perceived behavioral control and subjective norm were measured on 5-point Likert scales.



*Norm-activation theory constructs.* We used 3 items from Bosnjak, Tuten and Wittmann (2005) to measure personal norms. Awareness of consequences was based on the scale Hopper and McCarl Nielsen (1991) used and consisted of 3 items, reflecting three potential consequences of purchasing at a sustainably supplied store (e.g., less freight traffic in city centres). Finally, ascription of responsibility was based on Heath and Gifford (2002). Three items were formulated that measured to what extent respondents felt they were responsible for the three consequences used in the awareness of consequences scale (e.g., to what extent they felt responsible for decreasing the amount of freight traffic in city centres). All norm-activation constructs were measured on 5-point Likert scales ranging from ‘totally disagree’ to ‘totally agree’.

### **Measurement Properties**

We conducted a confirmatory factor analysis to assess unidimensionality. A good model fit is obtained:  $\chi^2(168) = 289.66, p < .001$ , confirmatory fit index (CFI) = .96, Tucker-Lewis index (TLI) = .95, incremental fit index (IFI) = .96, and root mean squared error of approximation (RMSEA) = .05. These results indicate unidimensionality.

To assess convergent validity of the measures, we tested the significance and analyzed the magnitude of each indicator’s loading on its intended latent variable (Anderson & Gerbing, 1988). The loading of one of the items of perceived behavioral control is not significant ( $p > .05$ ). Therefore, this item is deleted. All other items are significant at  $p < .001$  with standardized loadings above the recommended value of .6 (Bagozzi & Yi, 1988).

Cronbach’s alpha is used to assess construct reliability. All constructs score above the recommended value of .7 (attitude towards purchasing at a sustainably supplied store: .90,

perceived behavioral control: .73, subjective norm: .73, personal norms: .87, ascription of responsibility: .89, awareness of consequences: .83, intention to purchase at a sustainably supplied store: .90).

Finally, the average variance extracted (AVE) is computed. The AVE for subjective norm is .48 and thereby just below the recommended value of .5 (Fornell & Larcker, 1981). Deleting one item would increase the AVE to .54. However, the factor loading of this item is highly significant and deleting the item would result in a decrease in reliability of .05. Therefore, we decide to keep all items of subjective norm. The AVE of all other constructs is above .5. Discriminant validity is assessed by comparing the AVE of each construct with its squared correlations with the latent constructs. For each pair of latent variables, the AVE is higher than the squared correlations between the variables, indicating discriminant validity (Fornell & Larcker, 1981). Descriptive statistics (means and standard deviations) and correlations of the variables can be found in table 1.

## **RESULTS**

### **Model specification**

We specify structural equation models using Amos 7.0 to estimate the effects of attitude towards purchasing at a sustainably supplied store, perceived behavioral control, subjective norm, personal norms, ascription of responsibility and awareness of consequences, on intention to purchase at a sustainably supplied store. In Model 1 we only include main effects of these variables on purchase intention. In Model 2a, 2b, 2c, and 3, we add different interaction effects between personal norms, ascription of responsibility and awareness of consequences. We use

## TABLE 1

### Descriptive Statistics and Correlations

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Insert table 1 about here  
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maximum likelihood estimation to estimate the models. Because Model 3 is the full model containing all main and interaction effects, Model 1, 2a, 2b, and 2c are nested in Model 3. Thereby, we can make a proper comparison as to which model fits the data best.

To estimate our models with interaction terms, we use the orthogonalizing approach suggested by Little, Bovaird, and Widaman (2006). Thereby, we can avoid multicollinearity between the main effects and the interaction terms. After we have created orthogonalized indicators for each interaction term, we sum the indicators together to create sum scores for each interaction construct. These sum scores are used to represent that construct in the structural equation model. This approach is recommended for small samples (cf. Li & Calantone, 1998). The next step is to determine the reliability of the sum scores and to create the correlation matrix for all constructs (including the moderating terms). Because correlations between sum scores and other constructs tend to be attenuated, we correct for attenuation. The corrected correlation matrix is then used to estimate the models in Amos.

### Hypothesis Testing

In table 2 we present the findings of our analyses. All models show a good fit with the data (CFI = .97). Based on our hypotheses, we expect a model containing interaction effects for ascription of responsibility (AR) and/or awareness of consequences (AC) to provide a better fit than a main effects only model (which is Model 1). We can see that Model 2a provides a better model fit than

**TABLE 2**

**Analysis of Structural Models**

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Insert table 2 about here  
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Model 1, but the increase in fit is only slightly significant (decrease in  $\chi^2 = 3.71$  with 1 df,  $p < .10$ ). Models 2b, 2c, and 3 do not provide a significantly better fit than Model 1 despite the interaction effects that were taken into account. Models 1 and 2a-2c explain 68% of the variance in the intention to purchase at a sustainably supplied store, while Model 3 explains 69%. The difference is negligible.

If we look at the standardized estimates in table 2, we can see that five of the six main effects that were hypothesized are significant (at the  $p < .05$ ,  $p < .01$ , or  $p < .001$  level). Attitude towards purchasing at a sustainably supplied store has a positive effect on the intention to purchase at such a store, thereby confirming Hypothesis 1. Contrary to our expectations, we find no significant effect of perceived behavioral control on intention, so Hypothesis 2 cannot be supported. The significant positive effect of subjective norm on intention supports Hypothesis 3. In addition to the variables from the TPB, personal norms also have a positive effect on intention, thereby confirming Hypothesis 4. Furthermore, ascription of responsibility and awareness of consequences both have a positive effect on intention, in support of Hypothesis 5 and 6. With regard to the interaction effects, only the interaction between personal norms and ascription of responsibility seems to be slightly significant (standardized estimate  $-.08$ ,  $p < .10$ ). However, we hypothesized a positive effect and we find a negative effect. Hypothesis 7a and 7b are therefore not supported.

## **Additional Analyses**

Besides testing the integrated model, we also tested the original TPB and norm-activation theory separately. We present the findings of these analyses in table 3. If we compare the standardized estimates from the TPB model with the estimates from Model 1 (for this comparison we re-estimated Model 1 as a separate model, so non-nested in Model 3), we see that perceived behavioral control has a significant positive effect, in contrast to what we found for the integrated model. The estimates for attitude, but especially subjective norm are also much higher.

For comparing non-nested models, Morgan and Hunt (1994) suggest to take into account four factors: (1) CFI, (2) the percentage of hypothesized parameters that is significant, (3) the ability to explain variance in the outcome of interest (R-square), and (4) parsimony (measured by the PNFI). The difference in CFI between the TPB and the integrated model is very small, only .02. The TPB explains less variance in the dependent variable intention to purchase at a sustainably supplied store. This is simply caused by the fact that the TPB includes only three (significant) explanatory variables instead of the five that have significant effects in the integrated model. However, if we look at the parsimony normed fit index (PNFI), which takes into account both model fit and parsimony, Model 1 indeed obtains a better fit.

If we compare the norm-activation theory model to the integrated model, we see some differences in the size of the estimates (larger estimates in the norm-activation theory model), but in general the models are quite similar. In the norm-activation theory model, we also see the significant negative interaction effect between personal norms and ascription of responsibility that we saw before in the full model (Model 3). The other interaction effects are not significant. The CFI for the norm-activation theory model is again slightly higher (.02) than for the integrated model. Furthermore, the norm-activation theory model explains less variance in

### **TABLE 3**

#### **Additional Analyses**

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Insert table 3 about here  
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purchase intention, but the difference is only 6%, which is far less than the difference between the TPB and the integrated model. The PNFI is equal for both models.

### **DISCUSSION**

Integration of the Theory of Planned Behavior and the norm-activation theory in order to explain pro-environmental buying behavior provides us with the opportunity to draw more valid conclusions about which factors need to be considered when studying and trying to influence this kind of behavior. We find support for our model consisting of constructs from both theories. First of all, our hypotheses on the effects of the TPB constructs attitude and subjective norm on pro-environmental purchase intention are confirmed. This implies that, similar to ‘regular’ (non pro-environmental) buying behavior, people’s behavioral intentions are influenced by the way they evaluate the behavior (as favorable or unfavorable) and the way in which people who are important to them think about the specific behavior. These findings are in line with many studies that used the TPB to explain behavior in general and more specifically, pro-environmental behavior (e.g., Heath and Gifford, 2002; Van Birgelen et al., 2009). For perceived behavioral control, however, we did not find an effect on purchase intention. It seems that for this specific type of behavior, the degree of perceived control is not really an issue. For most people it is easy to go to whichever store they want and therefore the behavior is relatively easy to perform.

Besides the TPB, the norm-activation theory significantly contributes to explaining pro-environmental purchase intention as we hypothesized. In fact, personal norms have the biggest effect on pro-environmental purchase intention, thereby confirming the idea that pro-environmental behavior does indeed include a moral component and that it therefore is important to include personal norms if you want to explain this type of behavior. However, the original line of thoughts by Schwartz (1968a; 1968b) that personal norms only lead to behavior if they are activated by ascription of responsibility and awareness of consequences (by means of moderating effects) is not supported by our findings. Ascription of responsibility and awareness of consequences do have main effects on pro-environmental purchase intention. An interesting finding is the slightly significant negative interaction effect between personal norms and ascription of responsibility. Although it does not significantly contribute to an increase in model fit or explained variance in purchase intention in this study, it certainly deserves further research to see whether this finding is specific to the behavior that we studied (pro-environmental purchase intention) or that it also shows up in other (pro-environmental) behavior.

### **Theoretical Implications**

By showing the importance of integrating the TPB and norm-activation theory for studying pro-environmental buying behavior, we contributed to the research fields of consumer buying behavior and pro-environmental behavior. With regard to consumer buying behavior, the addition of personal norms as being influential for the way in which consumers make choices to buy somewhere is quite new. Although there have been a few studies on the role of personal norms in product choice (e.g., Van Birgelen et al., 2009), this is the first study that takes into account personal norms for the decision to choose a specific store. With regard to pro-

environmental behavior, this is the first study that integrated the complete TPB with the complete norm-activation theory. Based on this, more valid conclusions can be drawn as to which constructs are important for explaining this type of behavior and in what way the theories can complement each other.

### **Managerial Implications**

Since this study focused on the specific research setting of sustainably supplied stores, our findings can directly assist managers of these stores in their decision whether or not they want to participate in the sustainable initiative. Although it might mainly be an internal consideration of these stores to participate in the initiative, the idea that consumers are willing to take into account the way their stores are supplied might stimulate them to participate. For the stores that already do participate, our findings provide factors that stores can focus on if they want to influence consumers' purchase intention. By influencing personal norms, for example, they might be able to increase consumers' intention to purchase at a sustainably supplied store, or more specifically *their* store.



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**TABLES**

**TABLE 1**

**Descriptive Statistics and Correlations**

<b>Variables</b>	<b>Mean</b>	<b>s.d.</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>
1. Intention to purchase at a sustainably supplied store	3.55	0.92	-					
2. Attitude towards purchasing at a sustainably supplied store	4.50	0.64	.56	-				
3. Perceived behavioral control	3.84	0.94	.33	.18*	-			
4. Subjective norm	3.72	0.66	.60	.43	.24	-		
5. Personal norms	3.07	1.03	.70	.39	.30	.58	-	
6. Ascription of responsibility	3.04	1.10	.53	.26	.27	.27	.46	-
7. Awareness of consequences	4.12	0.74	.57	.49	.37	.36	.39	.48

\* Significant at  $p < .05$ ; all other correlations are significant at  $p < .01$ .

N = 272.

**TABLE 2**  
**Analysis of Structural Models**

Variables	Model 1	Model 2a	Model 2b	Model 2c	Model 3
<i>Main effects</i>					
Attitude towards purchasing	.21***	.19***	.21***	.21***	.19**
Perceived behavioral control	.02	.05	.02	.03	.04
Subjective norm	.19**	.20**	.19**	.19**	.20**
Personal norms	.37***	.36***	.37***	.37***	.36***
Ascription of responsibility	.17**	.16**	.17**	.17**	.16**
Awareness of consequences	.17*	.17*	.17*	.16*	.18**
<i>Interactions</i>					
Personal norms × Ascription of responsibility		-.083 <sup>†</sup>			-.11*
Personal norms × Awareness of consequences			-.00		.04
Ascription of responsibility × Awareness of consequences				-.01	.02
Personal norms × Ascription of responsibility × Awareness of consequences					.02
$\chi^2$	314.79	311.08	314.79	314.69	309.74
df	217	216	216	216	213
Increase in model fit <sup>a</sup>		$\chi^2(1) = 3.71^{\dagger}$	$\chi^2(1) = 0.00$	$\chi^2(1) = 0.10$	$\chi^2(4) = 5.05$
CFI	.97	.97	.97	.97	.97
$R^2$	.68	.68	.68	.68	.69

<sup>†</sup>  $p < .10$

\*  $p < .05$

\*\*  $p < .01$

\*\*\*  $p < .001$

$N = 272$ . Significance is based on two tailed tests. Estimates are standardized estimates.

<sup>a</sup> For Models 2a, 2b, 2c and 3, this number equals the increase in model fit relative to Model 1.

**TABLE 3**

**Additional Analyses**

<b>Variables</b>	<b>Model 1 (Integrated model)</b>	<b>TPB model</b>	<b>Norm-activation theory model</b>
<i>Main effects</i>			
Attitude towards purchasing	.21***	.35***	
Perceived behavioral control	.03	.16*	
Subjective norm	.19**	.41***	
Personal norms	.36***		.52***
Ascription of responsibility	.17**		.13*
Awareness of consequences	.17*		.31***
<i>Interactions</i>			
Personal norms × Ascription of responsibility			-.14*
Personal norms × Awareness of consequences			.07
Ascription of responsibility × Awareness of consequences			.03
Personal norms × Ascription of responsibility × Awareness of consequences			.00
$\chi^2$	267.63	65.12	136.89
df	149	38	92
CFI	.96	.98	.98
PNFI	.72	.66	.72
$R^2$	.68	.49	.62

†  $p < .10$

\*  $p < .05$

\*\*  $p < .01$

\*\*\*  $p < .001$

$N = 272$ . Significance is based on two tailed tests.