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The behavior of the consumer for organic products has been largely explored in the academic literature, based both on actual and intended purchases. In Mediterranean Europe (mainly Italy, Spain and Greece) studies have shown that attitudes towards organic food, importance attached to different organic food attributes (human health, safety, etc.) and consumers' concerns towards the environment are the most important factors that explain consumers' organic food purchase decisions. At the same time other studies emphasize the importance of knowledge of organic production in consumer organic behavior. It is assumed that information about organic food helps consumers to transform the credence characteristic of such products into search attributes, thereby allowing the consumer to better evaluate the quality before deciding to buy the product.

Integrating both approaches, this paper tries to explain purchase organic food products in Spain taking into account the role played by not only attitudes and concerns, but also whether organic knowledge is affecting this decision. To achieve this goal a three-equation multivariate probit model is fitted where organic knowledge, the intention to purchase organic foods and, the final decision to purchase are the dependent variables. Data has been obtained from an ad-hoc survey conducted in two medium-sized Spanish cities.

KEYWORDS: organic consumers, multivariate probit, Spain

1. Introduction

During the last two decades the interest in organic food products among consumers and producers has increased. By the end of 2008, more than 200,000 farms managing approximately 7.8 million hectares were engaged in organic farming in Europe, representing 4% of European agricultural area and 24% of the World's organic surface. Spain with 988.323 hectares was the second European country with the largest organic surface, behind Italy (FIBL, 2008). Nowadays, 17,000 Spanish companies produce, process or import organic food productions, out of which 6,000 of them are located in Andalusia.

On the demand side, the largest market for organic products in 2008 was Germany with a turnover of 5.8 billion euros, followed by the UK (2.6 billion euros), France and Italy (both 1.9 billion euros). The development of organic demand in Spain is much weaker, with a turnover around 0.25 billion Euros. Thus, although organic demand in Spain is increasing, most of organic production is exported, and there is a potential market for organic production in Spain which is not coming to be. Therefore, understanding why consumers choose to buy organic products is a key issue to promote the development of this market.

As consumers are gradually assigning more importance to the diet-health relationship, food safety and environment when making their food choices, these three vectors should positively affect the market development of organic products.

Consumer behavior for organic products has been largely explored in the academic literature, based both on actual and intended purchases. In The Northern Mediterranean countries (mainly Italy, Spain and Greece), several studies have shown that attitudes towards organic food, the importance attached to different organic food attributes (human health, safety, etc.) and consumers' concerns towards the environment are the most important factors that explain consumers' organic food purchase decisions.

Some of these studies have analyzed the intention to purchase organic foods following Ajzen (1991) theory of planned behavior (TPB). At the same time, other studies emphasize the importance of knowledge regarding organic foods in consumer behavior. Information about organic food allows consumers to transform the credence characteristic of such products into search attributes, thus the consumer can better evaluate the quality before deciding whether to buy the product. Based on these previous findings the objective of this paper is to better understand the organic food purchase decision in Spain. To achieve this goal a three-equation multivariate probit models is fitted where organic knowledge, the intention to purchase organic and the final organic purchase decision are the dependent variables. Several factors such as consumers' socio-demographic characteristics, attitudes, subjective norms and perceived behaviour control have been included to explain consumers' decision-making process for organic foods. Data has been obtained from an ad-hoc survey conducted in two medium-sized Spanish cities. Results can then be used to derive recommendations for organic industry to establish appropriate market strategies to the development of the future demand for these products.

The paper is structured as follows. It begins by presenting the research framework and hypothesis specification. Section 3 describes information and variables definition. Section 4 presents the empirical application and the results, and finally, section 5 concludes with a discussion of the marketing implications.

2. Background

The study of organic choice is a complex phenomenon because it depends on many cognitive factors that cannot be directly observed. There have been several published papers on organic consumers conducted in different European countries, covering a broad range of issues including: i) consumer's awareness and knowledge about organic foods; ii) consumers' attitudes and perceptions; iii) consumer's preference for organic foods; and

iv) willingness to pay a premium price. This section is focused on factor influencing the intention to purchase organic food products and the final purchase decision in order to provide evidence on which factors to include in the explanation of consumers' decision-making process for organic products.

Some of these studies have analyzed, the intention to purchase because as Ajzen (1991) in the theory of planned behavior (TPB) stated, intention is the best predictor of behaviour. Intention is the cognitive representation of a person's readiness to perform a given behaviour, and it is considered the immediate antecedent of behaviour. Moreover, the TPB links behavioural intentions with attitudes, subjective norms and perceived behavioural control.

Attitudes towards the behavior refer to the degree to which an individual has a favorable or unfavorable evaluation of the behavior (Ajzen, 1991). According to Ajzen (1991), the more favorable the attitudes towards a behavior, the stronger is the persons' intention to perform such behavior. Findings from several studies focused on organic consumers revealed that consumers' attitudes related with health beliefs and believing organic products are of higher quality than conventional ones have positive effects on the intention to purchase organic food. Likewise, environmental attitudes have an impact on consumers green purchase intentions (Grunert and Juhl, 1995; Torjusen et al., 2001; Millock et al., 2004; Chryssohoidis and Krystallis, 2005; Padel and Foster, 2005; Kuhar and Juvancic, 2005; Honkanen et al., 2006; Tarkianen and Sundqvist, 2005; Gracia and de Magistris, 2008a, de Magistris and Gracia, 2008b). Grunert and Juhl (1995) analysed the environmental attitudes and their relationship with the decision to purchase organic foods. They concluded that positive attitudes towards environmental issues are positively correlated to the purchase of organic foods and also to the frequency of purchase. Torjusen et al. (2001) analysed the factors affecting the choice of organic produce for Norwegian consumers. Their findings suggested that attitudes towards the health attribute of organic foods significantly explain organic foods choice. Millock et al. (2004) studied the effect of both private (taste, freshness and health) and public factors (environmental and animal welfare) on consumers' choice for organic foods in Denmark. Their results showed that environmental and animal welfare attitudes influenced organic food choice to a lesser extent than the attitudes towards taste, freshness and health aspects of organic food. Chryssohoidis and Krystallis (2005) indicated that the most important motives behind the purchase of organic products are healthiness and better taste of the organic food in Greece. However, environmental motives influenced organic foods choice to a lesser extent. Padel and Foster (2005) concluded that consumers buy organic food products because they perceived them to be better for their health. Moreover, they found that the attitudes towards environmental protection

were also a factor that explains organic food buying decisions. Kuhar and Juvancic (2005) investigated the main factors explaining the purchase frequency for organic and integrated fruit and vegetables in Slovenia. Results indicated that two quality aspects (taste and visual attractiveness) and consumers' environmental concerns are also factors explaining the frequency of purchasing organic fruit and vegetables.

Tarkianen and Sundqvist (2005) analyzed the factors that affected the purchase behavior of organic food in Finland. Their results showed that consumers' intentions to buy organic food were predicted by their attitudes and environmental concerns. Honkanen et al. (2006) studied the motives driving organic food choice in Norwegian consumers. Findings indicated that ecological motives and attitudes towards organic food had a significant influence on the intention to purchase organic food. Finally, Gracia and de Magistris (2008) and de Magistris and Gracia (2008) investigated the organic purchase behavior of Italian consumers. They found that consumers' attitudes towards organic food, in particular towards the health attributes and towards the environment are the most important factors that explained consumers' decision-making process for organic food products. To sum up, all these studies show that buying organic products is driven both by private and public benefits, the ranking of which differs from case study to case study.

Ajzen (1991) also identified the role of subjective norms in explaining behaviour. Subjective norms refer to the perceived social pressure to perform or not to perform the behavior. In other words, subjective norms are an individual's conviction that acting in a certain way is right or wrong regardless of personal or social consequences. Not so many studies have examined subjective norms in relation to organic food purchases.

Sparks and Shepherd (1992) studied the green consumer including subjective norms but their explanatory power was significant but relatively weak. Tarkianen and Sundqvist (2005) investigated the correlation between subjective norms and attitudes towards organic food. The authors suggested that the link could be explained with social environment's influence on an individual's attitudes' formation. In the same line, Arvola et al., (2008) found that subjective norms predicted purchase intentions of organic foods in Italy, Finland and United Kingdom. Smith and Paladino (2010), in their study of organic consumer in Australia, stated that subjective norms were a significant factor in the decision-making of consumers.

Last, Ajzen (1991) also identified that the perceived control behavior, defined as the perception of the ease or difficulty of performing the behavior of interest anticipating some obstacles, was an important factor explaining the intention to perform the behavior. Past research of organic consumption shows that the most important reasons for not buying the organic food were lack of availability and organic food's relatively higher price compared to conventional food products (Boccaletti and Nardella,

2000; Magnusson et al., 2000; Fotopoulos and Krystallis, 2002; Zanolli and Naspetti, 2002; and Tarkian and Sundqvist, 2005).

Consumer's knowledge is a relevant construct that affects how and what consumers decide to buy. Organic food information attained by consumers is an important issue in the organic food market because it represents the only instrument that consumers have to differentiate the attributes of organic food products from those of conventional ones, and build positive attitudes towards organic food (von Alvesleben, 1997). Moreover, Yiridoe et al. (2005), in their literature review, stated that knowledge on organic food products can affect consumers' organic buying decision for two reasons. The first one being through the fact that lack of knowledge is considered the number one reason why consumers do not buy organic food. The second reason is that consumers who do not have sufficient information on organic food products cannot clearly differentiate the unique attributes of organic from conventionally grown alternatives. Usually, many organic food consumers identify organic products based on the organic logos and labels attached to the product. The authors concluded that information about organic food helps to transform the credence characteristic of such products into search attributes, thereby allowing the consumer to better evaluate the quality before deciding to buy the product. Hill and Lynchehaun (2002) found that knowledge represents an important factor influencing the purchase of organic products. Poelman et al. (2008) analyzed whether information on organic production and fair trade affects the preference for and perception of pineapples in British and Dutch individuals. The results indicated a slight positive impact of organic product information on consumers' preference and perception for pineapple. Gracia and de Magistris (2008) and de Magistris and Gracia (2008) also provided evidence on the positive influence of consumers' organic knowledge on Southern Italian purchasing behavior. Finally, socio-demographic characteristics were found to be significant in explaining the decision to buy organic foods mainly in empirical studies conducted in USA (Thompson, 1998; Thompson and Kidwell, 1998; Blend and Ravenswaay, 1999; Wessells *et al.*, 1999; Loureiro *et al.*, 2001; Onyango *et al.*, 2006; Zepeda and Lin, 2007), while in Europe only age, education and household size were significant (Millock *et al.*, 2003; Lockie *et al.*, 2004; and Tsakiridou *et al.*, 2006; Gracia and de Magistris, 2008). Findings from the latter studies indicate that older, more educated consumers and those living in larger households are more likely to buy organic food products. Based on both findings from published papers on organic food demand mentioned and the Ajzen' model (1991), the model of consumer behavior (purchase) for organic food products shown has been established

(INSERT FIGURE 1)

3 Data and methodology

3.1 Data collection

Data were collected from a survey conducted in two medium-sized Spanish towns, Cordoba and Zaragoza, during October and November 2008. These towns were selected to be representative of both the North and the South of the Country. Zaragoza was chosen because it is a town widely used by food marketers and consulting companies since the socio-demographic profile of this town is representative of the Spanish Census of Population. Córdoba was chosen because it also partly fulfils the same characteristic for population distribution. The questionnaire includes questions related to consumers' organic purchase decisions, intention to purchase, attitudes towards organic food products, organic knowledge and social norms related with food organic choices. The questionnaire also contained questions on socio-demographic characteristics (i.e. sex, family size and composition, age, education level, income) and consumers' health habits and status. Prior to the main survey, this questionnaire was validated using a pilot survey of 20 consumers in each town to test for understanding and interview length.

Sample size in both towns was set at 400. As both populations can be considered infinite, this sample size results in a sampling error of $\pm 5\%$, assuming a confidence level of 95.5% ($k=2$) and $p=0.5$. A stratified random sample of consumers was made on the basis of town district and age. A number of representative grocery stores and supermarkets were selected in each town district, and food shoppers were randomly selected outside these food outlets. Target respondents were the primary food buyers in the household and interviews carried out face to face. Interviewers approached the randomly selected individuals asking them one screening question, whether they were the main household food shopper. Summary statistics for the socio-demographic characteristics of the full sample are presented in Table I. Most individuals participants are female (54%) living in households of 3 members on average. In addition, the average ages is of about 45 years and nearly 34% belong to high income groups and about 36% of the subjects have university degree.

(INSERT TABLE 1)

3.2 Model Specification

All endogenous variables of interest are discrete variables. The first equation in the model is consumers' organic food purchases (OP), specified as follows:

[1]

where, Y_i represents all the exogenous variables and ξ_i is the normally distributed error term $N(0, \sigma_\xi^2)$. K_i^* is the unobserved organic knowledge, and as before, the researchers observe an ordered level of organic knowledge, as follows:

$$\begin{aligned}
 K_i = 1 & \quad \text{if} \quad K_i^* \leq \psi_1 \\
 K_i = 2 & \quad \text{if} \quad \psi_1 \leq K_i^* \leq \psi_2 \\
 K_i = 3 & \quad \text{if} \quad \psi_2 \leq K_i^*
 \end{aligned}
 \tag{6}$$

To estimate the three equations [1], [3], and [5], we have assumed that the error terms (u_i , e_i and ζ_i) may be correlated. Then, instead of independently estimating them, they are considered to be a multivariate limited-dependent-variable model, in which the three error terms (u_i , e_i and ζ_i) follow a multivariate normal distribution with mean zero and variance and covariance matrix Ω . The limited dependent-variable (LDV) model with correlated error terms are estimated using Hajivassiliou and McFadden's (1998) procedure implemented in Proc QLIM in the SAS[®] 9.1 statistical software package.

3.3 Variables definition

The organic food product purchases variable (PURCHASE) was measured by a dummy variable where 1 meant that the consumer reported that he has already bought at least sometimes organic food products and 0 otherwise. The intention to purchase intention (INTENTION) was measured in five levels, where 5 meant the highest probability to purchase organic food products. Finally, organic product knowledge (KNOWLEDGE) was measured by the consumers' self-reported level of knowledge from 1 to 3, where 3 indicated the highest level of knowledge. Regarding healthy habits, consumers were asked whether they carried out voluntary annual health check up (CHECKUPS), did exercise (SPORT) and they were not smoker (NOT SMOKER). They were measured using dummy variables where one meant that the consumer undertook the questioned task. Moreover, consumers were asked whether they used to try new and different food products (NEW_FOOD), which was measured by dummy variables where 1 meant yes and 0 otherwise. Finally, consumers were asked whether they had ever heard about organic food products (HEARD). Attitudes towards organic foods were measured by two variables on a 1 to 5 scale where 5

meant the higher level of agreement. The first one (HEALTH) measured whether consumers believed that organic food products were healthier than conventional ones. The second one measured whether consumers believed that organic food were environmentally friendly (ENVIRONMENT). Attitudes towards organic purchase were measured by two variables (“I believe that buying organic food is good” and “I support to buy organic food products”). Respondents were asked to rate these sentences on one scale from 1 to 5 where 5 means the higher level of agreement. Subjective norms were measured by one variable on a 1 to 5 scale where 5 meant the higher level of agreement (“Most people who are important to me think that I should buy organic foods”). Finally, perceived behaviour control (DIFFICULTY) was measured by asking to consumers whether they wanted to buy organic food, they would ever be able to do so. Perceived behaviour control was measured on a 1 to 5 scale where 5 meant the higher level of agreement.

4 Results

The estimated parameters for the model defined by [1], [3], and [5] equations using variables in table 1 are presented in table 2. Only exogenous variables statistically different from zero at a significant level of 0.05 have been finally included. Results show that correlations between equations are significant at the 5% level. It means that errors for all equations are highly correlated. Therefore, we can conclude that the equations are not independent and that the simultaneous estimation of both equations in the model is the appropriate approach to obtain consistent parameter estimates. Significant variables in the organic knowledge equation include socio-demographic characteristics, health habits and food related lifestyles. (UNIVERSITY, CHECKUPS, SPORT, NO_SMOKER, and NEW_FOOD). As we expected, the positive coefficient associated with the UNIVERSITY variable indicates that highly educated consumers are more likely to report higher organic product knowledge. Among health habits variables, CHECKUPS, SPORT, and, NON_SMOKER have a significant and positive impact on organic product knowledge, indicating that healthy habits (measured as practicing sports and no smoking and check health-status) positively affects organic knowledge. Also, findings are in accordance with Schifferstein and Oude Ophuis (1998), Chryssohoidis and Krystallis (2005) and de Magistris and Gracia (2008). Finally, the variable NEW_FOOD, also presents a positive significant impact on organic knowledge. This means that those consumers more prone to try new products are more knowledgeable on organic food products. Finally, there is a positive and significant impact on HEARD variable on organic knowledge, suggesting that the more consumers have heard about organic food products, the more they are likely to know them.

As we expected, the KNOWLEDGE variable has a statistically positive significant effect in the intention to purchase organic food products equation. This result indicates that consumers with higher organic knowledge are more likely to buy organic food products. This result is in agreement with previous studies (Schifferstein and Oude Ophuis, 1998; Hill and Lynchehaun, 2002; Chryssohoidis and Krystallis, 2005; de Magistris and Gracia (2008). On the other hand, the intention to purchase (INTENTION), as stated by the theory of planned behavior, is explained by attitudes towards the products, attitudes towards the organic purchase, subjective norms and perceived behavior control. However, subjective norms have not been statistically significant explaining the intention to purchase. The positive and statistically significant estimate coefficient for the HEALTH variable indicates that the more consumers believe that organic foods are healthier than conventional food; the more likely they are to buy organic food products. In the same way, consumers' attitudes towards environment (ENVIRONMENT) have been positive and statistically significant. It means that the more consumers believe that organic food are environmentally friendly, the more likely they will be willing to purchase organic food products. These findings are consistent with those reported by Grunert and Juhl (1995); Torjusen et al. (2001); Millock et al. (2004); Chryssohoidis and Krystallis (2005); Padel and Foster (2005); Kuhar and Juvancic(2005); Honkanen et al. (2006); Tarkianen and Sundqvist (2005); Gracia and de Magistris (2008), de Magistris and Gracia (2008). Moreover, there is a significant relation between the intention to purchase organic food products (INTENTION) and other variables related with attitudes towards organic purchase (GOOD, and SUPPORT). Findings suggest that consumers who believe that buying organic food products is good and they support to buy them, are more likely to purchase them. In addition, there is a negative and significant relation between the intention to purchase organic food and the perceived behavior control (DIFFICULTY). The result indicates that those consumers who believe that they are able to buy organic foods they are more likely to purchase them. Finally, the intention to purchase organic food (INTENTION) estimated parameter is positive and statistically significant in final organic purchase decision. This means that the intention to purchase is the most important determinant of the final purchase decision. Only two additional variables, income (HINCOME) and whether the consumer tends to try new food products (NEW_FOOD) positively influence the final purchase decision.

(INSERT TABLE 2)

5. Final remarks

The objective of this study is to investigate which factors influence Spanish consumers when shopping organic food products. The findings suggest that organic purchase behavior is affected by intention to purchase and self-

reported knowledge. In addition, organic knowledge depends mostly on consumers' health habits, suggesting that consumers who follow a healthy lifestyle are more likely to know organic food products. On the other hand, consumers who have positive attitudes towards organic foods and towards environment, are more likely to purchase them. Actually, they believe that they are beneficial for their health, but also they are environmentally friendly. Moreover, they think that it is good to buy them and they support to buy them. However, Spanish consumers do not present a pro-social behavior because social norms were not found to be significant on the intention to purchase organic foods. Therefore, the findings of this study leave some opened questions. Spanish consumers seem to be concerned with satisfying only their personal needs. There is no ethical conscience that leads consumers to prefer organic food because their purchase helps the environment and, then the whole community. Therefore, future research must be addressed to investigate which factors drive consumers to be more altruistic than selfness. Only once these factors have been identified, it would be possible to increase the demand of organic foods in Spain, since the high competence between them and other healthy and functional food products limit the expansion of the organic market.

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Figure 1: organic consumer decision-making

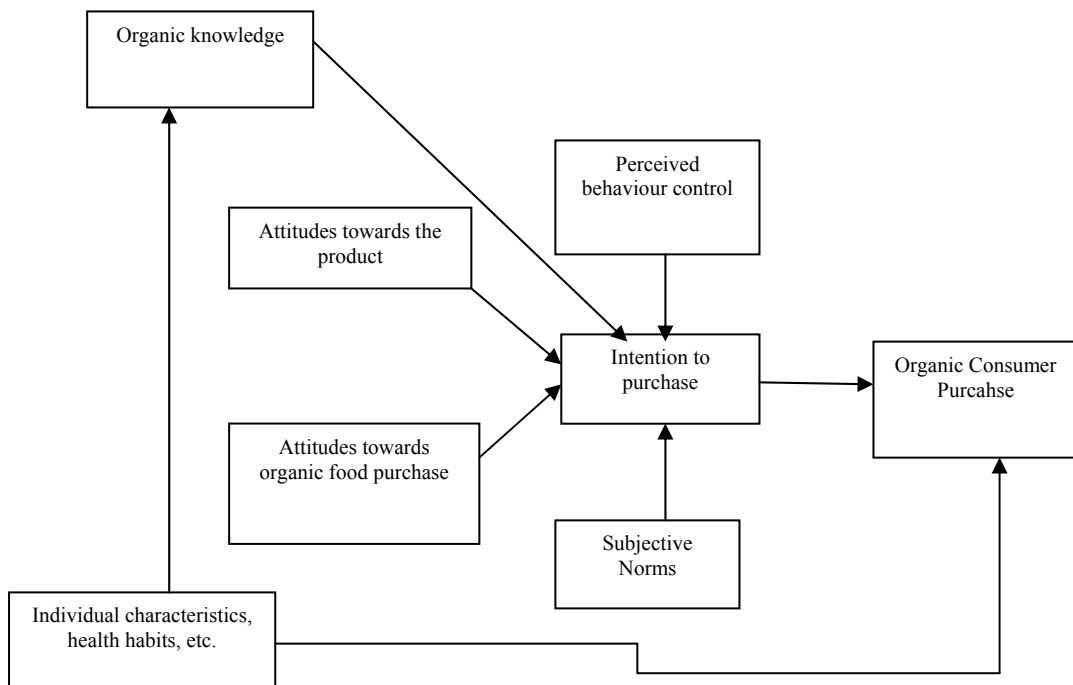


Table 1. Sample characteristics and exogenous variables definition.

Variable definition	Name (type)	Value
<i>Individual characteristics</i>		
Gender		
Male		54.5
Female	FEMALE(dummy)	
Age (Average from total sample)	AGE (continuous)	45.5
Education of respondent	UNIVERSITY (dummy)	36.3
Average Household Income		
Households with income higher than €2,500/month	HINCOME (dummy)	34
Household Size	HSIZE (continuous)	3.3
<i>Health habits and status</i>		
Consumer undertakes annual health checks ups (1=Yes)	CHECKUPS (dummy)	23.41
Consumers do exercise	SPORT (dummy)	54.7
No-smoker consumers	NSMOKER (dummy)	58.2
Consumers that try new and different foods	NEW_FOOD (dummy)	48.1
Consumer have heard about organic foods	HEARD (dummy)	91.4
<i>Attitudes towards organic foods</i>		
Organic food products are beneficial for the health	HEALTH (5-point increasing scale)	3.82
Organic food products are environmentally friendly	ENVIRONMENT (5-point increasing scale)	3.80
<i>Attitudes towards organic food purchase</i>		
I believe that buying organic food is good	GOOD (5-point increasing scale)	3.71
I support to buy organic food products	SUPPORT (5-point increasing scale)	3.09
<i>Subjective norms</i>		
Most people who are important to me think that I should buy organic foods	SNORM ((5-point increasing scale)	2.67
<i>Perceived behavioral control</i>		
If organic foods were available in the shops, I do not think I would ever be able to do so	DIFFICULTY (5-point increasing scale)	2.85
<i>Consumer's organic knowledge</i>		
High (3)	KNOWLEDGE	61.9
Medium (2)		32.3
Low (1)		5.7
<i>Intention to purchase organic food</i>		
Yes		3.11
Probably yes		9.71
Indifferent	INTENTION (5-point increasing scale)	28.5
Probably no		44.6
No		14.20
Organic purchase	PURCHASE (dummy)	47.9

Table 2. Estimates of the Multivariate Probit Model: Organic Purchase Behavior in Spain

Coefficients	Knowledge		Intention to Purchase		Organic Purchase	
	Estimates	t-ratio	Estimates	t-ratio	Estimates	t-ratio
Intercept	-2.197	-7.27 ***	-1.472	-5.40 ***	-2.94	-9.30 ***
UNIVERSITY	0.3171	3.64 ***				
HINCOME					0.2429	2.60 **
CHECKUPS	0.2396	2.72 ***				
SPORT	0.2238	2.60 **				
NSMOKER	0.1984	2.30 **				
NEW_FOOD	0.198	-2.30 **				
HEARD	1.58	5.44 ***			0.2314	2.58 **
HEALTH			0.085	1.96 *		
ENVIRONMENT			0.112	2.95 ***		
GOOD			0.3496	6.60 ***		
SUPPORT			0.2286	5.30 ***		
DIFFICULTY			-0.055	-1.80 *		
KNOWLEDGE			0.724	5.14 ***		
INTENTION					0.753	8.59 **
N	803					
Log Likelihood	-1994					
μ_2	1.3865	18.07				
μ_3	0.873	9.10 ***	1.913	16.23 ***	3.423	20.98 ***
<i>Correlations</i>						
Knowledge			-0.4330	-4.13 ***	0.2816	4.74 ***
Intention to purchase					-0.3804	-4.85 ***

*** (***) denotes statistical significance at the 1 (5) (10) per cent significance levels

Contact information

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