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The effect of personality traits on consumers' preferences for extra virgin olive oil

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1. Introduction

Olive oil is a food product consumed in most Mediterranean countries and is an essential component of the Mediterranean diet (Garcia-Closas et al., 2006). Its importance in the daily lives of consumers reflects its ancient traditions, its social and agro-environmental dimensions, as well as its health and nutritional benefits. The European Union produces 73 percent of the world's olive oil and consumes about 66 per cent (International Olive Oil Council, 2013). As Figure 1 shows, the main olive oil producers and consumers are Spain and Italy. However, an important expansion of olive oil consumption may be observed outside the traditional Mediterranean countries (United States International Trade Commission, 2013). The Mintel Global New Products Database (GNPD) database reveals that 1,116 new olive oils were launched from 2011 to 2013 all around the world. Of these, stores in the USA stocked about 15 percent, followed by Brazilian stores with about 13 percent (see Table 1).

Olive oil characteristics are regulated within the EU by Regulation (EEC) N° 2568/91, which establishes a list of physical, chemical, and organoleptic characteristics, as well as methods for their measurement. However, continuous research and development (R&D) in this sector has produced a large variety of olive oil types and specifications, making consumers more dependent on displayed information to make their purchasing decisions. Olive oil quality attributes are mainly communicated on the product label, which builds pre-consumption confidence among consumers (Scarpa and Del Giudice, 2004). Olive oil labels typically fall within the category of "credence attributes," including organic production certifications and protected denomination of origin (PDO), which consumers cannot directly value through consumption of the oil (Nocella et al., 2012).

Understanding oil consumption requires accounting for new olive oil varieties and trademarks developed worldwide and for the increasing public awareness of the health and environmental benefits associated with the Mediterranean diet and PDO products. However, different consumers may focus on different information cues, and therefore may develop specific behavioral criteria when making purchasing decisions (Menapace

et al., 2011; Philippidis et al., 2002). Hence, better understanding of how consumers evaluate olive oil is essential to help producers succeed in an increasingly competitive market.

More understanding of how consumers construct their evaluations and their consequent purchasing decisions with respect to marketed olive oils is also important to EU policy makers and regulators. It is extremely likely that olive oil consumption will increase at world level. The current orientation of EU olive oil policy, as stated in the European Commission web page,[1] is "to maintain and strengthen its position in world markets by encouraging production of a high quality product for the benefit of growers, processors, traders and consumers." However, this is not an easy task, as an individual's preferences depend not only on the extrinsic and intrinsic attributes of the products to be purchased but also on factors unrelated to food (Chen, 2007; Nocella et al., 2012).

This paper aims to identify the effect of consumers' specific characteristics, namely the role of food-related personality traits, lifestyle orientations, and purchase habits in shaping their purchase intentions regarding olive oil. To achieve this objective, data from a survey carried out from a representative sample of Catalonian (north-eastern Spain) consumers have been employed. The methodological framework is based on a discrete-choice modeling approach, named the hybrid choice model (HCM). This model specifically accounts for preference heterogeneity in examining the effects of individual personality traits, lifestyles, and habits.

Traditionally, the HCM model has involved two steps.[2] In the first step, latent variables (i.e., food-related personality traits, lifestyles or purchase habits, among others) are derived from observed indicators via a "multiple-indicator, multiple cause" model (MIMIC), used to relate latent individual traits to observable determinants. In the second step, the predicted latent variables are incorporated into the discrete-choice model as explanatory variables to estimate a multinomial logit model.

[1] http://ec.europa.eu/agriculture/olive-oil/index_en.htm

[2] Alternatively, the HCM can be seen as resulting in both efficient and consistent estimates (Ben-Akiva et al., 2002; Kløjgaard and Hess, 2011; Rungie et al., 2012). However, this approach usually results in convergence and identification problems, as the number of latent variables increases (Ashok et al., 2002). In this study, due to the high number of latent variables introduced, the sequential estimation method of the HCM based on the mixed logit model is used.

Our paper extends the existing literature in at least two ways. First, it does not merely estimate latent variables from observed indicators, but also estimates the hierarchical relationships between latent variables using a structural equation model (SEM), providing better insight into the consumers' cognitive decision-making processes. Second, this study employs an HCM in a panel-data context constructed from the repeated-choice data set while considering sample heterogeneity. It estimates a random parameter logit (RPL) model, considering the latent variables as random parameters (Yáñez et al., 2010) and solving the HCM problem of integrating the variation of the latent variables within the basic framework of multinomial choice models (Ashok et al., 2002).

The paper is structured as follows. Section 2 outlines the methodological framework used—the HCM. The design of the empirical application is shown in Section 3. Specifically, we will concentrate on how the SEM model has been specified and how the choice experiment has been designed. The main results are outlined in Section 4. The final section contains some concluding remarks.

2. Methodological framework: the HCM

The discrete-choice model approach has received a significant amount of attention in recent literature (Campbell et al., 2010; Greene and Hensher, 2013). Moreover, evidence of preference heterogeneity in both revealed and stated preference data is increasing. Failure to account for preference heterogeneity may result in poor model performance, which could lead to reliability problems in the model results (Hynes et al., 2008). Different methodological approaches have been suggested in the literature: 1) the use of latent class models (McFadden, 1986; Boxall and Adamowicz, 2002); 2) the inclusion of interaction effects to explain sources of heterogeneity (Montgomery, 2001); 3) the use of random parameter estimates, assuming preference coefficients to be randomly distributed across individuals (Revelt and Train, 1998; Walker and Ben-Akiva, 2002); and 4) the combination of interaction effects and random parameters (Hensher and Greene, 2003) or latent class and random parameters (Bujosa el al., 2010; Greene and Hensher, 2013).In all cases, individuals' utilities and the heterogeneity of their preferences are assumed to be a function of the observed variables. However, these

observable product attributes and covariates can only explain part of the utility, and fail to capture the true inner process of a decision maker.

Ben-Akiva et al. (2002) extended the traditional discrete-choice model by introducing the HCM. The HCM model defines an individual's utility as a function of observed explanatory variables, such as product attributes and respondents' socio-economic characteristics, while including latent variables that can reflect consumers' psychological factors, personality traits, or attitudes. Previous empirical applications of the HCM have been mainly in the field of transport economics (Bolduc et al., 2008; Yáñez et al., 2010), and recently in sociology (Rungie et al., 2011, 2012) and health economics (Kløjgaard and Hess, 2011). They have shown that: 1) the inclusion of latent variables significantly improves the goodness-of-fit of the model; and 2) psychological factors better contribute to capturing a consumer's preference heterogeneity. One of the main contributions of this study is that it constitutes one of the first attempts to apply the HCM approach to food marketing.

The application of the HCM implies the design of a choice experiment, which is based on both random utility theory (RUT) (McFadden, 1974) and Lancaster consumer theory (Lancaster, 1966). The RUT assumes that the utility provided by alternative *j* (*j=1,...,J*) from choice set *s* (*s=1,....,S*) to individual *i* (*i=1,…N*) is given by the following:

$$U_{ijs} = V_{ijs} + \varepsilon_{ijs} \quad (1)$$

where V_{ijs} is a deterministic component and ε_{ijs} is the stochastic or non-observed component. In a traditional model, the deterministic component, V_{ijs}, can be represented as a function of alternative attributes as follows:

$$V_{ijs} = \beta_{ikjs} * X_{kjs} \quad (2)$$

where X_{kjs} is the vector of attributes related to alternative j; β_{ikjs} is the vector of marginal utilities of the individual *i* related to the *k* attributes in alternative *j* from the choice set *s*.

In the HCM, latent variables are incorporated in the deterministic component of an individual's utility V_{ijs} as follows:

$$V_{ijs} = \beta_{ikjs} * X_{kjs} + \beta_{lijs} * \eta_{lijs} + \beta_{qijs} * \xi_{qijs} \quad (3)$$

where η_{lijs} is the vector of endogenous latent characteristics (*l=1,....L*), ξ_{qijs} is the corresponding vector of exogenous latent characteristics *(q=1,…,Q)*; and β_{lijs} and β_{qijs} are the vectors of the marginal effects of η_{lijs} and ξ_{qijs} on the utility function of the *i*-th individual when choosing alternative *j* from the choice set *s*.

However, these latent variables are immaterial constructs that cannot be directly observed: the usual approaches to identifying them rely on MIMIC or SEM models. Both require additional information about these latent variables (i.e. personality traits, purchase habits, or lifestyles). The MIMIC model considers only a group of latent variables that are explained by a set of observable determinants. The SEM also takes into account the structural relationships that can exist among latent variables.

The SEM consists of two sets of equations. The first, a set of *measurement equations*, describes the relationship between latent (exogenous ξ_{qijs} and endogenous η_{lijs})[3] and observed variables (w_{pijs} and x_{mijs}), after performing a confirmatory factor analysis (Equations 4 and 5) (Jöreskov and Sörbomm, 1996). The second, a set of structural equations, describes the relationship between endogenous and exogenous latent variables, and permits the evaluation of the causal effects among these variables (Equation 6) (Jöreskov and Sörbomm, 1996).

$$x_{mijs} = \Lambda_{mqijs}\xi_{qijs} + \delta_{mijs} \quad (4)$$

$$w_{pijs} = \Lambda_{plijs}\eta_{lijs} + \Gamma_{pijs} \quad (5)$$

$$\eta_{lijs} = \alpha_{lijs}\eta_{lijs} + \theta_{lijs}\xi_{qijs} + \zeta_{lijs} \quad (6)$$

where the indices *m, p, l, q, i, j,* and *s* refer to indicators that describe exogenous latent variables, indicators that describe endogenous latent variables, endogenous latent variables, exogenous latent variables, respondents, alternatives, and choice sets, respectively. Λ_{mijs} , Λ_{pijs} , α_{lijs}, and θ_{lijs} are the parameters to be jointly estimated. δ_{mijs}, Γ_{pijs}, and ζ_{lijs} represent the error terms that are typically considered normally distributed with mean zero and standard deviation to be estimated, and assumed to be

[3] The term "exogenous latent variable" means that it is not dependent on any other variable in the model. Usually one or more variables in the model are dependent on this variable. Endogenous latent variables refer to latent variables that are dependent on one or more variables in the model. Note that an endogenous variable may be dependent on another endogenous variable.

uncorrelated with ξ_{qijs}, η_{lijs}, and both ξ_{qijs} and η_{lijs}, in Equations 4, 5, and 6, respectively. The Full SEM model is estimated with Robust Maximum Likelihood (RML), due to a potential lack of normality.

Now, the probability of consumer *i* choosing the alternative *j* from the choice set s, assuming that the stochastic component ε_{ijs} follows the type I Extreme Value distribution, is defined as follows:

$$P_{ijs} = \frac{exp(\mu V_{ijs})}{\sum_{t=1}^{J} exp(\mu V_{its})} \quad (7)$$

The sequential estimation method of the HCM requires integrating over the variation of latent variables within the basic framework of multinomial choice models (Ashok et al., 2002). Yañez et al. (2010) showed that this integration could be attained by estimating an RPL model that considers the latent variables as random parameters.

Under the RPL model, the probability that individual "i" chooses alternative "j" from a particular choice set s is given by the following:

$$P_{ijs} = \int L_{ijs}(\beta_{ijs}) f(\beta_i|\theta)\, d\beta_i \quad (8)$$

where $f(\beta_i|\theta)$ is the density function of the β_i coefficients, and θ refers to the moments of the parameter distributions, which can take any specified form, such as normal, lognormal, triangular, uniform, etc. Moreover,

$$L_{ijs}(\beta_{ijs}) = \frac{exp\left(V_{ijs}(X_{ijs},\eta_{lijs},\xi_{qijs},\beta_i)\right)}{\sum_{t=1}^{J} exp\left(V_{its}(X_{its},\eta_{lits},\xi_{qits},\beta_i)\right)} \quad (9)$$

The parameter estimates β_{ijs}, are defined to capture additional non-observed variations and to better explain preference heterogeneity between individuals, as follows (Hensher et al., 2005):

$$\beta_{ijs} = \beta_{js} + \delta_{js} Z_i + \sigma_{js} \vartheta_{ijs} \quad (10)$$

where β_{js} is the sample-mean for the alternative j from the choice set s; ϑ_{ijs} is the individual specific heterogeneity, with mean zero and standard deviation equal to 1 (Hensher and Greene, 2003); and Z_i is a set of choice invariant characteristics that produce individual heterogeneity in the means of the randomly distributed coefficients, such as individual specific characteristics.

Because the resulting model is specified to include both fixed and random coefficients, the simulated maximum likelihood (SML) technique provides a faster and easier way to estimate the individual choice probabilities (Ben-Akiva et al., 2002). According to Train (2003), the simulation proceeds in three steps for any given value of θ. First, a value of β_i is drawn from $f(\beta_i|\theta)$ (β_i^r with r = 1… R[4]). Second, the logit $L_{ijs}(\beta_i^r)$, is calculated from this draw. Finally, Steps 1 and 2 are repeated, and the obtained results are averaged. This average is the simulated probability:

$$\widehat{P_{ijs}} = \frac{1}{R}\sum_{r=1}^{R} L_{ijs}(\beta_i^r) \quad (11)$$

where R is the number of draws. The simulated probabilities are inserted into the log-likelihood function to give a simulated log-likelihood (SLL):

$$SLL = \sum_{i=1}^{I}\sum_{j=1}^{J} d_{ijs}\, ln\widehat{P_{ijs}} \quad (12)$$

where d_{ijs}=1 if i chooses j from the choice set s and d_{ijs}=0 otherwise. The maximum simulated likelihood estimator, (MSLE), is the value of θ that maximizes SLL.

3. The experiment design

3.1. The survey

The data used in this study were obtained from a survey carried out on a representative sample of the Catalonian (north-east Spain) population with quotas by postal code. The survey was addressed to those responsible for shopping within the household. The Spanish market was selected because Spain is top-ranked together with Italy among those countries producing and exporting olive oil, in terms of both quantity and value (International Olive Oil Council, 2013). Additionally, olive oil constitutes a fundamental component of the Spanish diet.

As a consequence, many Spanish consumers are knowledgeable about this product, and most of them are aware of market prices and product characteristics. In Spain, the market value for organic olive oil was 5.4 million Euros in 2012 (MAGRAMA, 2013).

[4]Halton draws were used because they have been shown to provide more efficient distributions for numerical integration compared to random draws (Bhat, 2003).

Catalonia is second among Spanish regions in terms of total olive oil consumption, with a per capita consumption of 9.93 liters in 2011. It also occupies the second position in relation to the consumption of organic olive oil (13 percent of the Spanish total consumption in value) after Madrid. The population in Catalonia is quite heterogeneous, with a combination of urban (Barcelona is the second-largest city in Spain) and rural environments.

Information was gathered from 401 persons. Participants were recruited using two filters: 1) they had to have bought extra-virgin olive oil in the last three months; and 2) they were responsible for shopping within the household. Face-to-face interviews were conducted in September 2009 at different shopping hours and different types of food retail stores. The questionnaire consisted of four major blocks. The first block was designed to elicit information on respondents' purchasing and consumption habits with regard to different types of olive oil. The second and third blocks were reserved to obtain the latent variables and to collect information about socio-demographic characteristics and consumers' personality traits and lifestyles. All indicators were measured using eleven-point Likert scales (from 0 to 10, where 0 indicates total disagreement and 10 is total agreement).[5] The last block included the choice experiment task.

3.2. A conceptual model for organic olive oil purchasing intention

The first step in the HCM consists of defining the latent variables that will be introduced later in the discrete-choice model. In this paper, latent variables have been measured through a set of observable indicators, and the hierarchical relationships between the latent variables have been estimated using an SEM. In this section, the conceptual model on which the SEM is based is presented. Based on previous literature, we will define the main latent variables used for the purpose of this paper as well as the expected relationships between them.

[5] Respondents can easily understand this scale, as the grading system at Spanish schools is based on a similar system.

Previous studies have highlighted the importance of attitudes and perceptions in understanding the decision-making process during purchase (Ajzen, 2005; Ben-Akiva et al., 2002; Eertmans et al., 2005; Johansson et al., 2006; Scarpa and Thiene, 2011). Several studies have found that a relationship exists between an individual's personality traits, psychological characteristics, or attitudes to nutrition (Chen, 2007; Nocella et al., 2012).

In view of these results, the conceptual model we use draws on the Theory of Planned Behavior (TPB) (Jöreskov and Sörbomm, 1996) to define the behavioral latent variables to be introduced in the discrete-choice model (Ashok et al., 2002). As Ajzen (1991) has stated, the TPB was designed to predict and explain human behavior in specific contexts based on the relation between intention and behavior, so that intentions to perform a behavior (such as purchasing olive oil) are assumed to capture the motivational factors that influence such behavior. The TPB considers that human intentions to perform a behavior are guided by three types of consideration: 1) the "attitude" toward the behavior, or to what extent a person evaluates, either positively or negatively, the behavior in question; in the case of organic food, a positive attitude toward organic food is believed to be positively related to the intention to purchase organic food (Chen, 2007); 2) "subjective norms" or perceived social pressure, such as from family, friends, etc. to perform or not to perform the behavior (Ajzen, 1991, Al-Swidi et al. 2014); and 3) beliefs about the presence of factors that may facilitate or impede the performance of the behavior. The power of these control beliefs determines the "Perceived Behavioral Control" or perceived ease or difficulty of performing the behavior. In the framework of organic food, perceived control would include the effects of both external (such as time spent, availability, recognition by labeling, confidence, etc.) and internal variables (such as skills, knowledge, abilities, habits, etc.) that consumers believe can influence their judgment of risks and benefits associated with these products (Ajzen, 2005; Chen, 2007).

In the specific case of purchasing organic olive oil we can test the hypothesis that attitudes toward organic olive oil, subjective norms regarding olive oil, and the Perceived Behavioral Control in purchasing olive oil lead to the formation of a final behavioral intention to purchase. Figure 2 shows the conceptual model used in this study. Our model extends the TPB in two ways: identifying which personality traits

have an effect on shaping individuals' attitudes toward the behavior; and testing if extrinsic product features, such as available information, quality evaluation, and price can have an effect on facilitating the perception of control toward the behavior.

Chen (2007) showed that food-related personality traits, defined as food involvement or the level of importance that food has in a person's life (and operationalized as the extent to which people enjoy talking about food, entertain thoughts about food during the day, and engage in food-related activities: Goody, 1982), exert a positive effect on a consumer's attitude toward organic food. Bell and Marshall (2003) argued that the level of food involvement was a significant discriminating factor between food items in sensory evaluations. Eertmans et al. (2005) argued that both food intake and following a healthy diet appeared to vary with level of food involvement. Therefore, the following hypothesis is proposed:

Hypothesis 1a. Consumers who show a higher level of food involvement are expected to have a more positive attitude toward organic olive oil than consumers who give less importance to food.

Food-related personality traits link people to food-related activities, such as food procurement, preparation, cooking, etc. (Goody, 1982). The recent literature shows that cooking skills play a significant role in dietary changes to promote healthy eating (Van den Horsk et al., 2010). Due to the importance of olive oil in the Mediterranean diet, cooking skills are hypothesized to affect the attitude toward organic olive oil positively. Thus, the following hypothesis is proposed:

Hypothesis 1b. Consumers with better cooking skills are expected to have a more positive attitude toward organic olive oil than consumers with fewer cooking skills.

Another factor that has been emphasized as an important psychological variable in describing consumer food choice is lifestyle. Different lifestyles sort individuals into groups on the basis of the things they like to do, how they like to spend their leisure time, and how they choose to spend their disposable income (Moore, 1963; Krishnan, 2011). Lifestyle describes how people seek to express their identity in many areas, such as activities, interests, and opinions (Wells and Tigert, 1971). In a consumption environment, a person chooses a product or brand that seems to match with his/her life style/identity (Krishnan, 2011). An individual's lifestyle is reflected in his/her

personality and self-concepts, which are determined by his/her interests, opinions, activities, etc.

Moreover, attitudes, behavioral tendencies, and habits are derived from differences in lifestyles across consumers (Chen, 2009). Shaharudin et al. (2010) showed that consumers' lifestyles were related to their attitude toward the purchasing of organic food. Krishnan (2011) confirmed that consumers' lifestyles were strongly related to their purchased brands. Our model aims to identify two types of consumer lifestyle: healthy lifestyle and orderly lifestyle. The former emphasizes physical health-related activities, such as natural food consumption, health care, etc. (Gil et al., 2000). Eertmans et al (2005) argue that a healthy lifestyle should be advocated to render the consumer's attitude toward organic foods more positive. The orderly and methodical lifestyle can be expressed through activities such as disposing garbage in different containers, reducing stress, keeping equilibrium between working and personal life, et cetera. Therefore, the following hypothesis is proposed:

Hypothesis 1c: Consumers with orderly lifestyles can more easily follow environmentally friendly behaviors and therefore have a more positive attitude toward organic food than consumers who have less orderly lifestyles.

Over the last decade, food scares (BSE, dioxins, foot-and-mouth disease, etc.) have reshaped consumer behavior to a certain extent. Consumers are now more concerned about food safety issues (Chen, 2007). Moreover, according to Chen (2009), a healthy consumption lifestyle, attitudes toward organic food, and the intention to purchase organic food appear to correlate significantly. Therefore, the following hypothesis is proposed:

Hypothesis 1d. The healthier the consumers' lifestyle, the more positive their attitudes toward organic foods will be.

As stated before, extrinsic product features, such as available information, and purchasing habits such as quality and price valuation, can have an effect on facilitating the perception of control toward behavior. Indeed, Ajzen (2005) stated that the more resources and opportunities individuals believe they possess, and the fewer obstacles or impediments they anticipate, the greater should be their perceived control over the behavior. Therefore, the following hypothesis can be proposed:

Hypothesis 2a. With more information that consumers have regarding a product, such as its certification (labels), the greater should be the control they perceive to have regarding the specific acquisition.

Repetitive purchasing habits can simplify behavior, as many decisions become routine and can be adopted with minimal conscious control. In other words, individuals tend to persist in doing what they have are accustomed to doing. In this study, we have assessed the effect of "purchasing habits" by considering two latent variables, "Price Involvement" and "Quality Involvement," which have been considered by other authors to be relevant in explaining consumer buying behavior (Mann et al., 2012; Menapace et al., 2011). The first variable involves the relevance of price and price promotions in a specific purchasing decision. As shown by Avitia et al. (2015) the price has a highly relevant role in defining consumers' willingness to purchase sustainable food, and it can be considered as a limit for current consumption of sustainable food. Their work indicated that consumers value sustainable attributes and are willing to pay a premium for them, but this premium is still lower than the market price for such products. The same can be said in relation to quality standards. Therefore, the following hypotheses can be proposed:

Hypothesis 2b. As consumers become less sensitive to price and price promotions, their perceived behavioral control increases.

Hypothesis 2c. As food quality plays a more important role in consumers' food habits, their perceived behavioral control increases.

3.3. The choice experiment

Four attributes (price, production system, the origin of the product, and the origin of the brand) with three levels each were used in the experiment design (Table 2). The attribute and attribute levels were selected based on a three-step qualitative study: 1) a literature review of consumer behavior relating to organic and/or extra virgin olive oil; 2) four focus groups of eight people each were conducted to identify the main consumption patterns and attitudes toward extra virgin olive oil, with special attention to the organic attribute; and 3) observation in retail outlets to identify real prices and

informal interviews in the same retail outlets about reasons for choosing a specific product.

Considering the number of attributes and their levels in Table 2, a full factorial design of 81 ($3*3*3*3 = 3^4$) combinations was generated. Presenting respondents with one-liter bottles of olive oil with 81 combinations of attributes, however, could place a high level of cognitive burden on respondents. To reduce the number of combinations that participants had to evaluate, we followed Street and Burgess (2007) and generated an orthogonal fractional factorial design of nine combinations. These nine combinations were considered as the first option in each choice set. Since participants were provided with choice sets of three options each (plus a no-choice option), the other two options were obtained using the following generators (1212) and (2121) (Street and Burgess, 2007). This resulted in a 100 percent efficient main-effects design.

4. Results and discussion

4.1. Sample characteristics

As mentioned above, a total of 401 respondents completed the survey. About 80 percent were women, consistent with statistics reported by the Spanish ministry about shopping responsibility within the household (MAGRAMA, 2008). Approximately 70 percent of the respondents were married, and their average age was 49 years (with a standard deviation of 15.39). The average household size was three. Furthermore, 35 percent were households with one or more members younger than 18 years old, and only 14 percent had children under six years old. Regarding education level, 27.3 percent of respondents had only completed primary school, while 46.8 percent had completed secondary studies or professional education. Finally, regarding the geographic distribution of the sample, 40 percent came from Barcelona (the Catalonian capital), while 60 percent came from the rest of the Catalonian region.

Consistent with Jiménez-Guerrero et al. (2012), results from the survey suggest that most respondents usually purchase extra virgin olive oil, but only 9.25 percent of the respondents search for PDO extra virgin olive oil. Olive oil is normally purchased weekly or every two weeks, although a significant percentage of respondents (nearly 30 percent) purchase it monthly or quarterly (in many cases directly from a

402 farmer/producer or a cooperative). The consumption of organic olive oil is marginal
403 (less than 0.6 percent of respondents buy it regularly). Respondent's reasons for not
404 buying organic olive oil included the high price, the lack of availability in the
405 supermarket where they buy food, or lack of information about organic food.

406 **4.2. The SEM: Consumer's purchasing intentions**

407 Following the traditional procedure for estimating the SEM (Kline, 2005), a
408 confirmatory factor analysis (CFA) was first carried out for the entire set of constructs.
409 Six "personality latent variables" (orderly life style, healthy life style, price
410 involvement, food quality involvement, food involvement, and cooking skills) and five
411 "behavioral latent factors" (attitude, behavioral control perception, purchase intention,
412 knowledge, and subjective norms) were obtained (Tables A1 and A2, in the Annex).
413 Standardized factor loading estimates were all significant and above the recommended
414 value of 0.7 (Hair et al., 1999). The main parameters to test the robustness of the
415 construct, following Kline (2005), appear to show good results for almost all constructs.
416 The internal consistency of reliability of each construct reached an acceptable Cronbach
417 alpha of over 0.7, and the composite reliabilities were greater than 0.7, except for the
418 factor "Healthy Life Style", which was 0.6. Nevertheless, we chose to retain this factor
419 in our model.

420 The SEM was estimated in the second step. Table 3 summarizes the estimation
421 results and the main goodness-of-fit measures. The model meets the accepted goodness-
422 of-fit criteria according to Hair et al. (1999) and Kline (2005): 1) the normed Chi-
423 squared (NC) is less than 3; 2) the value for the root mean square error of
424 approximation (RMSEA) is 0.065 (less than 0.8); 3) regarding the incremental fit-index,
425 the comparative-fit-index (CFI) is 0.952, which exceeds the value guidelines in the
426 literature (0.90); 4) the normed-fit-index (NFI), non-normed-fit-index (NNFI) and
427 relative fit-index (RFI) are all above 0.9, indicating that the conceptual model
428 adequately fits the data; and 5) the adjusted R^2 values are reasonably high for this type
429 of model.

430 Results from Table 3 indicate that both consumers' social pressure (subjective
431 norms) and their Perceived Behavior Control positively affect consumers' intentions to
432 purchase organic olive oil, consistent with Chen (2007). However attitudes toward
433 organic olive oil are negatively related to organic olive oil purchasing intention. This

result is not surprising. There are two arguments supporting it. First, Avitia et al. (2015) showed that although Spanish consumers valued the sustainable food attribute they were not willing to pay a premium for this attribute. Second, in the specific case of olive oil, Spanish consumers do associate extra virgin olive oil with health and sustainable characteristic irrespective of the type of production system (organic or conventional) (Calatrava, 2002 and Vega-Zamora et al., 2011), making differentiation between the two types of olive oil more difficult.

Furthermore, only the variables "Food Involvement" and "Orderly Lifestyle" positively affect attitudes, which supports Hypotheses 1a and 1c., corroborating Chen (2007) and Bell and Marshall (2003), who state that consumers with higher food involvement personality traits have a more positive attitude toward organic food and are better able to discern healthier foods. Additionally, results reveal that an orderly lifestyle seems to enhance an individual's attitude toward organic olive oil. Gracia and Magistris (2008) obtained similar results, suggesting that consumers trying to follow an orderly life are more likely to develop environmentally friendly attitudes and follow a healthier diet in which olive oil plays an important role.

On the other hand, the relationships between attitudes, cooking skills, and healthy lifestyles are not significant (Hypotheses 1b and 1d are not supported). In both cases, this result is related to the perception of conventional olive oil as a healthy product, which already plays an important role in the Mediterranean diet. Organic olive oil is not perceived as healthier than its conventional counterpart, as mentioned above.

"Knowledge," "Food Quality Involvement," and "Price Involvement" significantly and positively affect consumer's Perceived Behavioral Control, which supports Hypotheses 2a and 2c but rejects Hypothesis 2b. Although the standardized factor loading of "Price Involvement" was significantly different from zero, its positive coefficient led us to reject its associated hypothesis (2b). This finding is consistent with Eertmans et al. (2005), who stated that price was negatively related to healthy diet.

4.3. The choice model: consumer's preferences for olive oil attributes

The second step in the HCM consists of estimating an RPL model that incorporates latent variables (LV) obtained from the SEM. The estimated utility function includes all attribute levels defined as effect-coded, except the price attribute, which is introduced as

a continuous variable as well as LVs. Socio-demographic variables, such as gender (GEND), age (AGE) and town size (TS), are defined as dummy variables (1 representing women, age less than 50 years, and town size over 10000 inhabitants, respectively). The education level includes three categories: university degree (UNIV), completed secondary school (SECOND) and primary school. Thus, two effect-coded dummy variables were defined. The first one was university degree (UNIV), which took the value 1 if the respondent had a university degree, 0 if the respondent has completed secondary school, and -1, otherwise. The second education dummy was having completed secondary school (SECOND), which took the value 1 if the respondents had completed secondary school, 0 if the respondent had a university degree, and -1, otherwise. Finally, all random parameters were assumed to be normally distributed.

Table 4 shows the estimated parameters from the RPL model. The no-option coefficient is negative and significant, which indicates that most of the respondents participated in the choice experiment by choosing one of the proposed olive oil alternatives instead of the no-option. The results also reveal that the organic attribute generates a disutility to consumers, while the most preferred olive oil is the one produced under a PDO. In line with Calatrava (2002), the organic attribute does not represent any additional value to Spanish consumers.

This finding contradicts the results reported in other studies, such as Gracia and Magistris (2008) for Italy, Soler et al. (2002), and Vega-Zamora et al. (2011) for Spain, or Tsakiridou et al. (2006) for Greece. However in these studies, consumers were only required to choose between organic olive oil and its conventional counterpart, whereas we have considered the trade-offs not only with other olive oil attributes but also with other attribute levels within the production system (i.e., PDO) in our study. Moreover, environmental concerns are not a key factor in a consumer's food choices, especially in the case of olive oil (Vega-Zamora et al., 2011). `

Contrary to the organic attribute, Catalonian consumers show a strong preference for PDO extra virgin olive oil. PDO extra virgin olive oil is well known among Catalonian and Spanish consumers. Twenty-eight PDO brands exist in Spain, and five of them are located in Catalonia. Additionally, the production of this type of olive oil continues to grow; the domestic market and, to a lesser extent, the EU are its main destinations (Ruiz-Castillo, 2008).

The results further reveal that the price parameter is negative and significant (Menapace et al., 2011; Vega-Zamora et al., 2011). The local origin of olive oil plays an important role in shaping consumer's preferences in Catalonia. Catalan olive oils are preferred over other Spanish or imported oils, while olive oil produced in other Spanish regions is preferred over imported olive oil, as in Jiménez-Guerrero et al. (2012). In contrast, the specific brand did not significantly impact consumers' utilities, which indicates that respondents are more interested in the origin of extra-virgin olive oil than in the origin of the brand. This result could be related to the fact that many consumers do not recognize the origin of the brand (that is, whether the manufacturer is located or not in Catalonia). The results also show that consumers do not value private labels for this specific product in general.

Interestingly, almost all personal trait LVs (except orderly lifestyle) significantly affected the respondents' preferences for extra virgin olive oil (Table 4). In line with previous results, we note that the sign of the variable "Healthy Lifestyle" is negative and significant. Consistent with previous results about the organic attribute, a healthy lifestyle is not related to the selection of olive oil, although healthy lifestyles may be conducive to healthier food choices (Losasso et al., 2012). In Catalonia, olive oil is perceived as a key feature of the traditional Mediterranean diet, and is widely used by consumers independently from their particular cooking habits or diets. This fact also can explain the negative sign of the coefficient related to the variable "Cooking Skills".

The other three variables, "Food Involvement", "Price Involvement", and "Quality Involvement" positively affect consumers' preferences for extra virgin olive oil (Table 4). A large number of extra virgin olive oil options are available in Catalonian markets, which can accommodate a broad range of preferences. People looking for good prices can easily meet their preference either by buying directly from the producer or cooperative (30 percent of our sample) or by choosing a promoted product at a retail outlet. Those looking for quality can also easily fit their preference.

Table 4 (middle part) shows that the standard deviations of all relevant attributes and personal traits are significant, which indicates heterogeneity in the preferences of Catalonian consumers. The negative effect of healthy lifestyles on consumers' preferences is not homogeneous across the sample. In fact, the negative coefficient becomes positive for women and younger people. The negative effect is mitigated for

529 respondents that have completed secondary school, but increases for people living in
530 larger towns. The negative effect of cooking skills is mitigated in the case of women
531 and well-educated people.

532 The positive effect of food involvement on consumer's utility increases for women
533 and the highest educated population, but it becomes negative for younger respondents.
534 The positive effect of "Price Involvement" is mitigated for women and the better-
535 educated population, but significantly increases for people living in larger towns. The
536 positive effect on the consumer's quality involvement when shopping is mitigated in
537 larger towns and, practically disappears in the case of women.

538 Finally, behavioral LVs affect the utility assigned to the organic attribute.
539 However, this attribute negatively affects the utility of consumers, as mentioned above.
540 The interaction parameters found at the lower part of Table 4 indicate that this negative
541 effect is partially mitigated in consumers affected by subjective norms or with a positive
542 attitude toward organic food. Nevertheless, the organic attribute does not seem to play a
543 significant role in the extra virgin olive oil market.

544

545 **5. Conclusions**

546 The use of limited information models, such as conventional choice models, could
547 be problematic if the decision-making process is strongly conditioned by consumers'
548 personality traits and lifestyles. In this paper, an HCM was applied to understand the
549 consumer's behavioral process related to the purchase of extra-virgin olive oil in
550 Catalonia. Special attention was paid to the organic attribute of the oil. This approach
551 has been proven to be flexible enough to investigate the effect of consumers' food-
552 related personality traits, lifestyles, and purchasing habits on their purchase intentions
553 regarding organic olive oil as well as to ascertain the main determinants of consumer
554 choice when buying extra-virgin olive oil.

555 The results from this study suggest that almost all personal trait LVs significantly
556 affect respondents' utilities toward extra virgin olive oil. "Healthy lifestyle" is
557 significantly but negatively associated with extra virgin olive oil utility, which shows
558 that olive oil preferences in Catalonia respond more to dietary traditions than to healthy
559 food choices. Nevertheless, this result was not homogeneous across the sample. In fact,

560 the negative effect of “Healthy Lifestyle” was mitigated in women. This result shows
561 that this population segment cares more about diet and the impact of food on health and
562 thus bases its food choices on health reasons.

563 Food-related activities (cooking skills) are more related to social and personal
564 activities than to healthy food measures. Extra virgin olive oil is normally used in
565 Catalonia for salads, boiled vegetables, or grilled food. People with superior cooking
566 skills attempt to use alternative products to traditional olive oil.

567 The variables “Price Involvement” and “Quality Involvement” also significantly
568 and positively affect the respondents’ attitudes toward extra virgin olive oil. These
569 factors are both associated with the “Perceived Behavioral Control” construct,
570 expressing the importance of available resources and opportunities in reinforcing
571 consumers’ perceptions. However, the effect of these two variables is not homogeneous.
572 Significant differences were found for people living in larger towns. While the overall
573 positive effect of “Price Involvement” increases in larger towns, the positive effect of
574 “Quality Involvement” is significantly mitigated.

575 The results also suggest that Catalan consumers perceive a disutility from the
576 organic attribute compared to other production system alternatives (conventional and
577 PDO). The price is not a relevant factor to explain this result, as organic olive oils are
578 cheaper than PDO olive oils on average. Environmental or health concerns seem not to
579 be relevant to consumers’ choices related to olive oil. The organic attribute is not
580 perceived as a significant quality cue, whereas people looking for quality select PDO
581 extra virgin olive oil. This result suggests that traditional marketing strategies that have
582 been used in Catalonia to promote the consumption of olive oils based on environmental
583 or health issues are not effective.

584 The results also indicate that the role of policy makers in the Spanish olive oil
585 sector should be re-assessed. In June 2012, the Commission launched an action plan for
586 the EU olive oil sector, which established six main areas among which quality control
587 and promotion were included. During the last few years in Spain there has been a
588 “premiumization” of olive oil, with the introduction of significant innovations in
589 varieties, packaging, etcetera. These innovations have been the focus of promotional
590 campaigns jointly financed by producer organizations and public institutions to increase
591 consumers’ awareness of the health benefits of olive oil. These campaigns have been

proven to be effective in export markets but have not been a commercial success in the domestic market.

This study has shown the relevance of behavioral control on shaping consumers intentions toward olive oil. Policy actions on improving consumers' perception of control on the olive oil market seem to be needed in Spain. Olive oil is part of the Spanish culture, but this does not mean that consumers have a good knowledge of types of olive oil, quality grades, etc. Public institutions should provide more information in an increasingly differentiated market. If policy makers aim at promoting sustainable production of olive oil for the domestic market the attributes "Organic" and "Local" should be reinforced with appropriate information campaigns about the characteristics of these attributes and adequate control mechanisms should be in place to strengthen authenticity and protect consumers.

The results of this study reinforce the need to include the psychological characteristics of consumers, such as attitudes, food-related personality traits, purchase habits, and lifestyle orientation, to explain how individuals make food choices and to understand their decision-making processes. These findings are likely to encourage a more widespread application of the HCM in the agro-food marketing field. From a methodological point of view, more research should be addressed to providing new tools to estimate the HCM while considering heterogeneity across individuals.

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790 Table 1 New olive oil products launched in the world food market from 2011 to 2013

Country	Number of products launched	Percentage
USA	167	15.0
Brazil	129	11.6
Italy	73	6.5
France	54	4.8
Germany	51	4.6
Mexico	48	4.3
Spain	42	3.8
India	38	3.4
Australia	34	3.1
Chile	32	2.9
Colombia	32	2.9
Argentina	30	2.7
UK	29	2.6
South Africa	27	2.4
Venezuela	26	2.3
Russia	25	2.2
Finland	22	2.0
Greece	20	1.8
Canada	19	1.7
Austria	17	1.5
Egypt	15	1.3
Hong Kong	13	1.2
Saudi Arabia	13	1.2
Ukraine	13	1.2
New Zealand	12	1.1
Thailand	12	1.1
Turkey	12	1.1
Czech Republic	11	1.0
Netherlands	11	1.0
Sweden	11	1.0
Vietnam	11	1.0
Portugal	10	0.9
China	9	0.8
South Korea	9	0.8
Israel	6	0.5
Norway	4	0.4
Poland	4	0.4
Singapore	4	0.4
Switzerland	4	0.4
Taiwan	4	0.4
Belgium	3	0.3
Denmark	3	0.3
Indonesia	2	0.2
Ireland	2	0.2
Hungary	1	0.1
Malaysia	1	0.1
Philippines	1	0.1
Total	1116	100.0

791 Source: MINTEL (2015). Global New Products Database (GNPD)

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794 Table 2 Attributes and attribute levels in the Choice Experiment

Attributes	***Levels***
Production system	Conventional Protected Denomination of Origin (PDO) Organic
Origin	Spain Catalonia Imported
Brand	Spanish manufacturer Catalonia manufacturer Private label
Price	**3.70 €/l** **6 €/l** **7.5 €/l**

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Table 3. Results from the Structural Equation Model (SEM) to explain consumer's purchasing intentions towards organic olive oil

Structural relationships	*Parameter Estimate*	*Std error*	R^2	*Goodness of fit statistics*
Attitude→ Food Involvement	0.299***	0.0653	0.329	
Attitude→ Healthy Life Style	-0.0784	0.0701		
Attitude→ Ordered Life Style	0.384***	0.0825		$\chi 2 = 2021.270$
Attitude→ Cooking Skills	0.033	0.0575		df = 741
Perceived Behavioural Control→ Knowledge	0.248***	0.0655	0.318	NC = 2.727 < 3
Perceived Behavioural Control→ Price Involvement	0.234***	0.0549		RMSEA = 0.0658 < 0.08 CFI = 0.952 > 0.90 NFI = 0.926 > 0.90
Perceived Behavioural Control→ Quality Involvement	0.491***	0.0532		NNFI = 0.946> 0.90 IFI = 0.952 > 0.90
Purchase intention→ Subjective Norm	0.167***	0.0351	0.623	RFI = 0.918 > 0.90
Purchase intention→ Attitude	-0.127***	0.0388		
Purchase intention→ Perceived Behavioural Control	0.772***	0.0559		

Notes : ***p<0.01;**p<0.05; *p<0.1

817 Table 4. Estimated parameters from the Random parameter Logil (RPL)

Parameters	***RPL***	***Standard error***
Conventional (CONV)[1]	1.280	----
Denominated Origin Protected (DOP)	0.251***	0.039
Organic (ORG)	-1.531***	0.253
Spanish origin (OSP)[1]	0.178	----
Catalan origin (OCAT)	0.490***	0.036
Imported origin (OIMP)	-0.668***	0.045
Spanish manufacturer (MSP)[1]	0.074	----
Catalan manufacturer (MCAT)	-0.005	0.050
Private brand (PRB)	-0.069	0.055
Price	-0.868***	0.027
No option (NOP)	-3.265***	0.818
Attitude (ATT)	----	----
Behavioral Control Prception (BCP)	----	----
Subjective Norm (SBN)	----	----
Orderly lifestyle (OLS)	-0.240	0.515
Healthy lifestyle (HLS)	-0.820**	0.282
Price Involvement (PIN)	1.587***	0.430
Quality involvement (QIN)	1.505**	0.537
Food involvement (FIN)	1.022**	0.463
Cooking-Skills (COS)	-2.408***	0.435
	standard deviations	Standard error
DOP	0.410***	0.032
ORG	0.733***	0.049
OCAT	0.765***	0.034
Price	0.794***	0.030
OLS	0.261***	0.024
HLS	0.549***	0.035
PIN	0.012	0.012
QIN	0.504***	0.041
FIN	Fixed Parameter	----
COS	0.149**	0.049
Parameter-Variable	*Heterogeneity in mean*	Standard error
ORG-ATT	0.276***	0.039
ORG-BCP	-0.093**	0.041
ORG-SBN	0.190***	0.033
OLS-SECOND	-0.511**	0.239
OLS-UNIV	-0.353	0.323
OLS-GEND	-0.854*	0.469
OLS-TS	1.804***	0.449
HLS-SECOND	0.661***	0.155
HLS-GEND	1.002***	0.243
HLS-TS	-2.070***	0.284
HLS-AGE	1.198***	0.230
PIN-UNIV	-0.881**	0.290
PIN-GEND	-1.198**	0.375
PIN-TS	0.779**	0.347
PIN-AGE	-0.491*	0.278
QIN-SECOND	1.820***	0.287
QIN-UNIV	-0.761**	0.382
QIN-GEND	-1.646**	0.501
QIN-TS	-1.072*	0.583
FIN-SECOND	-1.635***	0.247
FIN-UNIV	0.730**	0.352
FIN-GEND	0.964**	0.384
FIN-AGE	-2.241***	0.384
COS-SECOND	0.405*	0.233
COS-UNIV	1.425***	0.298
COS-GEND	1.009**	0.427
COS-AGE	2.689***	0.413
Goodness-of-fit		
L-likelihood	-2903.046	
R2 adjs	0.41527	

818 Notes : ***p<0.01;**p<0.05; *p<0.1; [1] Base level; (SE): Standard Error; Gender (GEND), age (AGE) and town size (TS), are
819 defined as dummy variables (1, representing women, age lower than 50 years, and town size over 10000 inhabitants, respectively).
820 Education is defined by two effect-coded variables: university degree (UNIV) and completed secondary school (SECOND)
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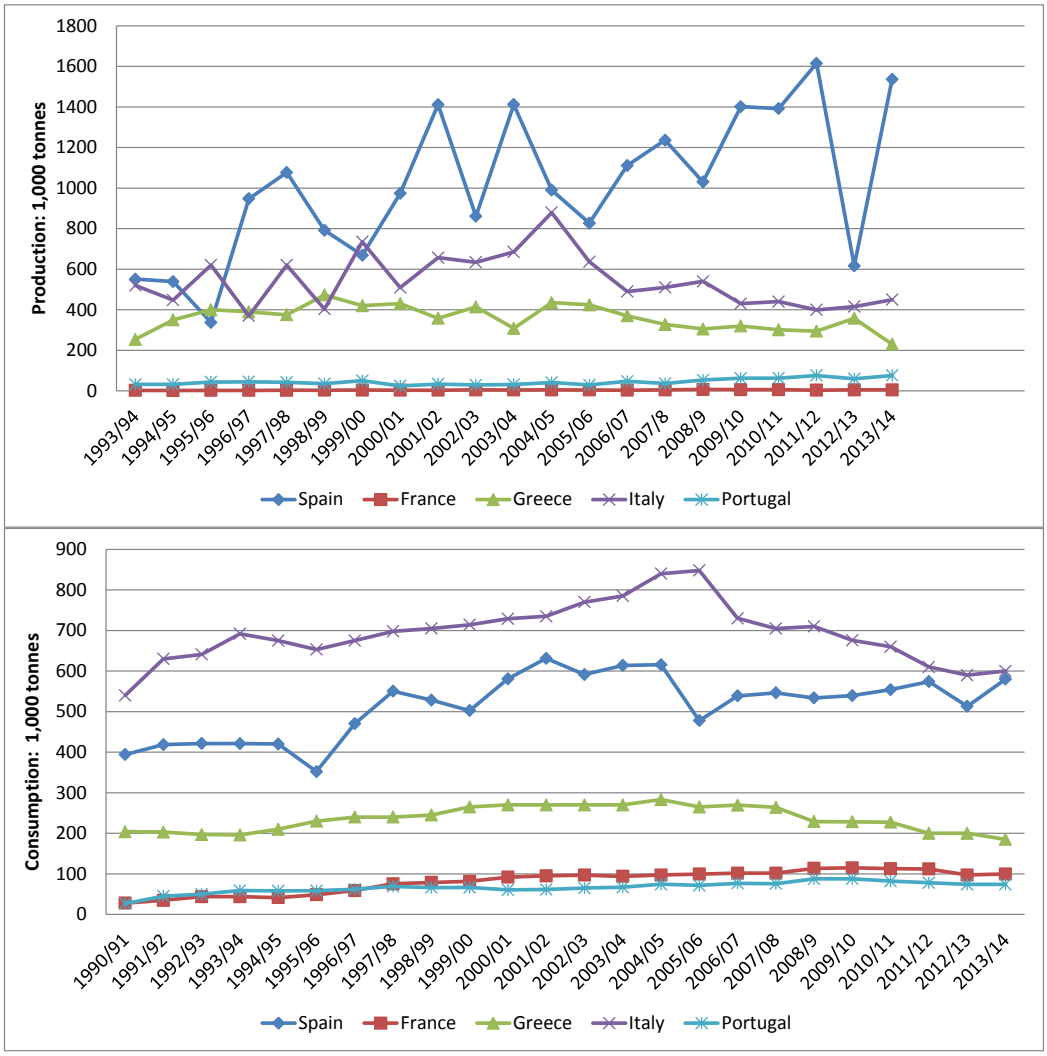
824 Figure 1. World olive oil production and consumption 1993-2014 (main countries)



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826 Note: 2012/13 data are provisional and 2013/14 data are estimated.

827 Source: Data from the international olive oil council (November 2013).

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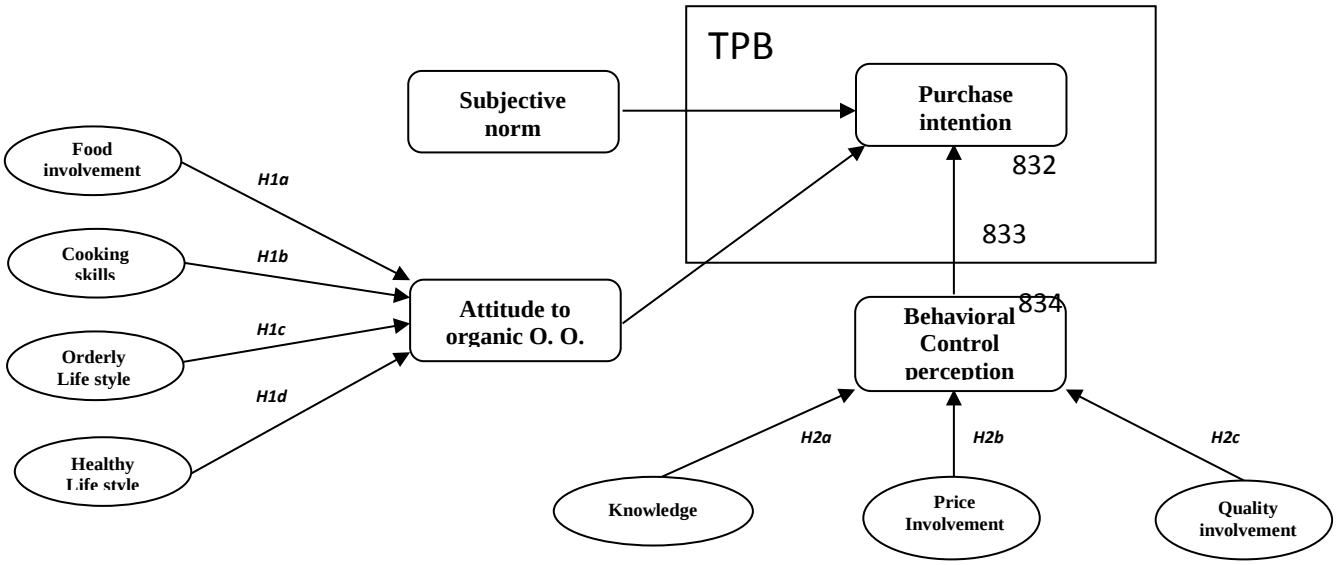
Figure 2. A conceptual model to understand organic olive oil purchase intention.



852 Figure 3. Example of a choice set

	Alternative "A"	***Alternative "B"***	***Alternative "C"***	***Alternative "D"***
System of production	***Extra-virgin olive oil with PDO***	***Conventional extra-virgin olive oil***	***Organic extra-virgin olive oil***	***None of them***
Origin of olive oil	***Spain***	***Catalonia***	***Imported***	
Brand	***Spanish Manufacturer***	***private label***	***Catalonia Manufacturer***	
Price	***3.70 €/liter***	***7.50 €/liter***	***6 €/liter***	

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Appendix A

Table A1. Confirmatory factor Analysis on personality traits

Índ	*Factores and items*	*Mean (SD)*	*Standardized Factor loadings (SE)*	*Variance*	*Cronbach 's Alpha*	*Composite Reliability (variance extracted)*	*References*
	Orderly Lifestyle			74.40%	0.82	0.819 (0.602)	Gil et al. (2000)
OLS_1	I try to reduce stress.	6.888 (1.892)	1.372*** (0.108)				
OLS_2	I try to lead an ordered life and methodical.	7.308 (1.571)	1.325*** (0.0674)				
OLS_3	I try to equilibrate between my work and my personal life.	7.317 (1.679)	1.304*** (0.104)				
	Healthy lifestyle			56.75%	0.57	0.559 (0.302)	Gil et al. (2000)
HLS_1	I try to control salt intake.	6.720 (2.74)	1.097*** (0.157)				
HLS_2	I eat frequently fruits and vegetables.	7.312 (2.180)	1.062*** (0.117)				
HLS_3	I try to not eat precooked foods.	8.180 (1.621)	1.489*** (0.121)				
	Food purchase			75.68%	0.88	0.885 (0.663)	Soler and Gil (2002)
FP_1	I usually buy more the product in promotions	7.040 (2.159)	1.995*** (0.0906)				
FP_2	I usually pay attention in the promotions.	7.135 (2.177)	2.072*** (0.0929)				
FP_3	I remember the price paid in the last time.	6.343 (2.397)	1.415*** (0.126)				
FP_4	I compare the prices of different bands available.	6.723 (2.160)	1.696*** (0.104)				
	Quality involvement			77.64%	0.83	0.840 (0.636)	Soler and Gil (2002)
QIN_1	I buy the product independently to their price.	5.535 (2.433)	1.656*** (0.117)				
QIN_2	It is relevant for me paying more if the product has more quality.	6.553 (1.813)	1.635*** (0.0851)				
QIN_3	Pay more if the product has a guaranteed quality.	6.683 (1.793)	1.578*** (0.0927)				
	Food involvement			68.08%	0.83	0.846 (0.584)	Adapted from Chen (2007) and Candel (2001)
FIN_1	Mainly, I eat to have good health.	7.947 (1.599)	0.942*** (0.0804)				
FIN_2	Eating is a pleasure.	8.248 (1.404)	1.065*** (0.0754)				
FIN_3	The food accounts a significant part of the family's traditions.	8.190 (1.486)	1.334*** (0.0664)				
FIN_4	The food is a link to provide information about other cultures.	8.015 (1.651)	1.314*** (0.0981)				
	Cooking skills			58.87%	0.76	0.767 (0.456)	Candel (2001)
COS_1	I like cooking.	6.697 (2.430)	1.522*** (0.120)				
COS_2	I like to watch food programs on TV.	6.082 (2.797)	1.895*** (0.126)				
COS_3	I like to subscribe to cooking magazines.	3.750 (3.091)	2.191*** (0.125)				
COS_4	I like to offer food as gifts.	5.650 (2.531)	1.69*** (0.128)				

Notes : ***p<0.01;**p<0.05; *p<0.1; SD: Standard Deviation; SE: Standard Error.

862 Table A2. Confirmatory factor Analysis on Behavioral factors

Índ	*Factor*	*Means (SD)*	*Standardized Factor loadings (SE)*	*Variance*	*Cronbach 's Alpha*	*Composite Reliability (variance extracted)*	*References*
	Attitude			81,96	0.97	0.948 (0.755)	Adapted from Alemán et al. (2006), and Roitner-Schobesberger et al. (2007)
ATT_1	The consumption of organic olive oil reduces human exposure to chemical residues.	6.867 (1.764)	1.502*** (0.110)				
ATT_2	Organic olive oil is healthy for children.	6.862 (1.660)	1.178*** (0.0678)				
ATT_3	The product is suitable for a healthy diet.	7.088 (1.636)	1.324*** (0.0666)				
ATT_4	The production of organic olive oil helps indirectly to reduce water pollution by waste chemicals and pesticides.	6.923 (1.680)	1.553*** (0.0579)				
ATT_5	The production of organic olive oil helps indirectly to conserve agricultural soil.	6.933 (1.716)	1.648*** (0.0563)				
ATT_6	The production of organic olive oil improves environmental sustainability	6.893 (1.809)	1.662*** (0.0626)				
	Behavioral Control Perception			69,79	0.87	0.816 (0.443)	Adapted from Krystallis and Chryssohoidis (2005), and Roitner-Schobesberger et al. (2007);
CP_1	I trust the product because of its certification by an organization or regulatory board of organic farming.	6.447 (1.601)	1.306*** (0.108)				
CP_2	I trust the product because it is sold exclusively in specialty stores.	6.668 (1.646)	1.293*** (0.0840)				
CP_3	I have confidence in the information provided on the product label.	6.202 (1.710)	1.35*** (0.0930)				
CP_4	I have confidence that a product certified as organic really is organic.	6.103 (1.866)	1.441*** (0.109)				
CP_5	The product is not available in the usual supermarkets where I normally do my shopping.	7.270 (1.843)	0.758*** (0.124)				
CP_6	Seek the product, me generates high cost in terms of time and money.	6.728 (1.862)	0.622*** (0.114)				
	Purchase intention			76,91	0.858	0.875 (0.701)	Adapted from Lea and Worsley (2005)
PI_1	If I have more information and confidence, I buy organic olive oil.	5.923 (2.179)	1.938*** (0.221)				
PI_2	I buy more if the product is cheaper.	5.770 (2.219)	1.856*** (0.100)				
PI_3	If organic olive oil is more readily available, I most often buy it.	5.655 (2.246)	1.912*** (0.116)				
	Knowledge			87,63	0.861	0.876 (0.780)	
KN_1	Lack information about the benefits of organic products.	6.905 (1.834)	1.586*** (0.118)				
KN_2	Lack of information about the label that identifies products as organic.	6.872 (1.889)	1.705*** (0.116)				
	Subjective norms			86,61	0.926	0.934 (0.825)	Chen (2007)
SBN_1	My kids prefer organic olive oil.	2.342 (2.475)	2.059*** (0.104)				
SBN_2	My family prefers organic olive oil.	2.465 (2.422)	2.382*** (0.0710)				
SBN_3	Persons who are important to me prefer organic olive oil.	2.578 (2.436)	2.215*** (0.0885)				

863 Notes : ***p<0.01;**p<0.05; *p<0.1; SD: Standard Deviation; SE: Standard Error.