

Article

Green consciousness as a determinant of organic food purchase intention: evidences from a case study in Italy.

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Abstract: The rapid growth of the organic food market in Italy and in other developed countries has drawn the attention of researchers and practitioners. The diffusion of pro-environmental concerns and sustainable lifestyles among consumers are often cited as two of the main drivers of the increase in demand for organic food products. Consequently, unveiling the factors that influence consumers' demand of, and preference for organic food is essential for all the actors involved in the supply chain. This paper presents the results of a research model which relates organic food purchase intention to consumers' green consciousness, health motivations, food safety concerns, organic product knowledge, family and social context and perception of the intrinsic quality of food. A questionnaire, based on the Theory of Planned Behavior (TPB) and the extant literature on organic food choice, was developed and presented to a sample of 600 Italian consumers. Causal relations among variables were then tested using Structural Equation Modelling. The results suggest that, besides the existence of green consciousness, other variables may affect consumers' preference for organic food: among these, specific and closely interlinked elements, such as food safety concerns and perceived quality heavily affected the intention to buy organic food products.

Keywords: Theory of Planned Behavior, organic food, green consciousness, purchasing behavior Structural Equation Modelling

1. Introduction

In recent years, as a result of public interest in quality of life, including the quality and preservation of the natural environment, the concept of sustainable development has become increasingly important for governments as well as consumers and enterprises [1].

Sustainability has become more and more used in different strategic documents, policies and development plans at the international, national and local level. Among these, the well-known "Brundtland Report" [2] and the "2030 Agenda" of the United Nation (UN) [3], and within the European Union (EU), the Common Agricultural Policy (CAP) [4], the Green Deal [5] and the "Farm to Fork" European strategy [6].

With respect to agricultural activities, the concept of sustainability refers to a broad array of practices, innovations, and technologies aimed at reducing negative environmental impacts of food production, as for example precision agriculture, organic farming, agro-ecology, agro-forestry and stricter animal welfare standards, carbon managing and

storing, adoption of circular economic models [5]. Nevertheless, organic certification remains for the consumer the main recognizable distinctive sign of the environmental sustainability of food [7]. Sustainability is also related to economic aspects, benefits for consumers and suppliers, and to its social dimension, that concerns the matching of food system with the priorities and needs of the society/citizens [1].

Therefore, in recent years the spread of sustainable food production and consumption has been accompanied by a growing interest of consumers over sustainability attributes of food. [8].

Hence, understanding the factors that influence choice and consumption of organic food is essential for all the actors in the supply chain, and several studies have already investigated sustainable consumption behavior [9-15].

According to the current literature the consensus view seems to be that the general attitude towards organic food appears more favorable than to conventional food, both among organic and non-organic consumers [1]. Indeed, the literature abounds with empirical confirmations of consumers' willingness to pay a premium for organic food and/or its specific attributes [16-19].

Organic foods have many meanings for consumers and consumers' buying motivations are not homogeneous [20-24]. "Organic products are perceived to be better with respect to taste, quality, safety, impact on health and on the environment, while a more negative attitude is found for the aspects price, appearance, availability and conservation. In addition, a positive perception prevails for regional and local food products since they have the image of freshness and quality and contribute to the regional economies and identity" [1] (p. 2).

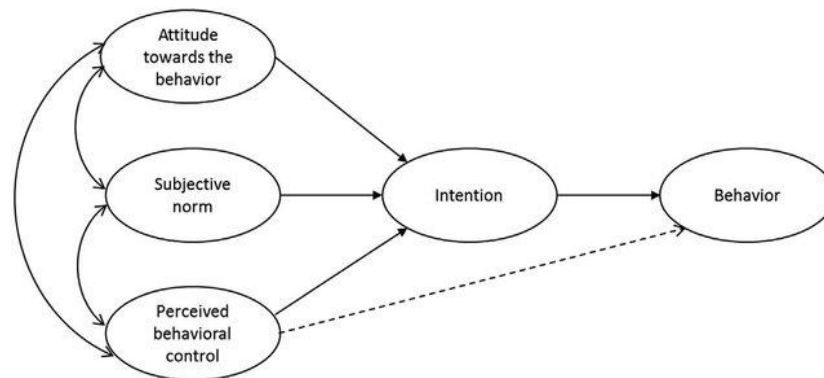
The aim of this research is twofold. On the one hand, our study intends to recognize and identify the complex of beliefs, motives, judgements and attitudes towards organic products and their specific features. On the other hand, we draw connections and relations among these elements and consumers' buying intentions. To this end, we designed an empirical study on the determinants of Italian consumers' behavior, based on the Theory of Planned Behavior (TPB) [25-27], which explains the causal relationships between beliefs and behavior.

The results suggest that, albeit prominent, consumers' pro-environmental consciousness is not the one and only determinant of their attitudes towards, and preference for organic food products far from it. In fact, our results shed light on the role of quality perception, as well as concerns for food safety related issues, as collateral determinants of consumers' intention to buy and eat organic food products.

2. Materials and Methods

The vast existing literature has discussed the personal determinants of organic food consumption and the different models used for the analyzes. Among these, one of the most adopted is the TPB, an extension of the theory of reasoned action (TRA) [25,28] proposed by Ajzen in 1991 [27]. The TPB is an expectancy-value model of attitude-behavior relationships [29,30] that postulates, in the original version, three conceptually independent determinants of intention: a) attitude towards the behavior (AB), b) subjective norm (SN), and c) perceived behavioral control (PBC). These variables lead to the formation of a behavioral intention or intention (I), that is assumed to be the immediate antecedent of behavior (B) [31,32]. Thus, when consumers intend to engage in a certain behavior, they are more likely to perform it. In Figure 1, the basic TPB model is graphically displayed.

Figure 1 – The theory of planned behavior model



Source: Ajzen, 1991 [27]

The TPB proposed by Ajzen was the base for several initial adaptation of this to different context and field of application. In several cases, the relationships between a) AB and SN; between SN and PBC, and between AB and PBC are omitted.

In this model, AB refers to the degree to which performance of the behavior is positively or negatively valued. SN refer to the social pressure you receive from people around you and people that are important to you in your life. Lastly PBC refers to whether it is easy or difficult to perform the particular behavior [33,34].

As a general rule, the more favourable the AB (i.e., favourable or unfavourable evaluation of the behavior) and SN (i.e., perceived social pressure), and the greater the PBC (i.e., perceived ability to perform the behavior), the stronger should be the person's intention to perform the behavior in question. Given a sufficient degree of actual control over the behavior, people are expected to carry out their intentions when the opportunity arises [35,36].

The TPB has been widely accepted by most social psychologists to understand and predict human behavior and it has been successfully applied to several domains of human behavior, including consumers' conducts and food choice.

However, although widely used, over the years the TPB has suffered various criticisms due to its presumed poor predictive efficacy, related, in particular, to the use of an insufficient number of variables to explain the reasons that push individuals to undertake a specific behavior in certain circumstances [37,38].

This possible limitation has led multiple authors to suggest changes to the variables already contemplated by the original theoretical model (AB, SN PBC) as well as to add others. So, the attitude to behavior is divided into several factors that determine it. Among the most common: "perceived ease of use", "personal moral norm", "ability to refuse", "perceived moral obligation", "past behavior", "perception of usefulness", "trust" and others depending on the specific field of scientific investigation [37].

Moreover, the literature concerning the application of TPB to food choice highlights a wide range of models based on the TPB related to findings in different fields of research, as for example economics, psychology, and nutrition [39-54]. Similarly, the ever-growing corpus of studies on organic food consumption is characterized by numerous applications and adaptations of the TPB, conducted in different countries, as well as diverse socio-economic and cultural contexts [12-14,55-80].

This corpus of literature identifies multiple determinants of organic food consumption choice, as for example: sustainability of resource and energy use; preference for renewable, rather than conventional and non-renewable, resources; positive impacts on the environment and its preservation; rejection of chemical and synthetic fertilizers, pesticides, and genetically modified (GM) organisms; consideration for animal welfare; atten-

tion to food safety and human health; nutritional and sensory characteristics of food; contribution to local economy and resilience of rural communities; promotion of healthy lifestyles and wellbeing [in particular 13,67]. Consumers' heterogeneity of perceptions is able to influence their behavior of purchasing organic food products; it is therefore necessary to examine which of the variables have the strongest effects [12,14].

Based on the extensive literature reviewed this study used a structural equation model (SEM) to test the relationships between antecedent constructs and organic food purchasing intention. The constructs and the objects are defined according to the literature on the subject [in particular, 13,23,67,71].

The antecedent constructs, together with the related items, were previously discussed in a focus group among 10 university researchers of different disciplines (marketing, commodities science, agricultural economics) of the University of Trieste and Udine. A preliminary version of a survey questionnaire was then administered to 100 test respondents with the collaboration of six university students, involved in laboratory activities. The results of this preliminary trial were discussed in a second iteration of the focus group, which led to more correctly identify the constructs and items to be included in the final version of the questionnaire.

Subsequently, based on the theory and findings available in the literature, and taking into account the results of the first trial survey, we adopted the following latent exogenous constructs:

- Food Safety concern (FS)
- Health consciousness (HC)
- Knowledge (K)
- Subjective norm (SN)
- Green conscious (GC)
- Perceived quality (PQ)

While the dependent construct is defined as:

- Purchase Intention (PI)

Food Safety concern (FS). Food safety represents the organic buyers' concern about the physical risks associated with the consumption of food resulting from chemical sprays, fertilizers, artificial additives and preservatives, and is often linked to farming methods [10,13,16,81-87]. Furthermore, Williams and Hammitt found that consumers believe organically grown products present fewer risks to consumers than conventional food products [83].

In line with the approach proposed by Michaelidou, and Hassan [87] we decide to consider food safety as separate from the health consciousness aspect, as the "Food safety" construct encompasses the perception of food not being harmful to human health, while "Health consciousness" concerns the specific set of food characteristics that contribute to improve consumers' wellbeing. Following these considerations, food safety is expected to be an important predictor of attitudes and purchase intentions towards organic produce, therefore we hypothesize that:

H1: Food safety concern will positively affect purchase intention of organic products

Health consciousness (H). Becker [88] defined health consciousness as the readiness to undertake health actions that drive people to engage in healthy behaviors. Health-conscious consumers care about the desired state of well-being and put forth an effort to maintain a healthy life. Such individuals tend to be aware of and involved with nutrition [87]. Previous research has identified interest in health as a primary motive for the purchase of organic food [12,87,88]. In addition, health consciousness has been found to predict attitudes, intention and purchase of organic foods [59,68]. Since organic produce buyers are aware that food intake affects their health, they appreciate healthy and natural foods and are willing to switch foods to improve their health [16,66,86,88].

Even though the relationship between health consciousness and attitude has not been supported in all studies [61] we nonetheless hypothesize that:

H2: Health consciousness will positively affect purchase intention of organic products

Organic product knowledge (K). Consumers may actively or passively develop familiarity with organic food through different means: for instance, they could personally buy and consume such products, but they could also collect information and general knowledge on organic agriculture through a variety of sources. All the actions through which individuals can acquire direct or indirect experience of organic foods will then contribute to build their own perceptions and expectations about the distinctive and enduring features of such products. Consumers nowadays tend to control food production processes more tightly and question the reliability and health effects of conventional food production methods. Production processes of organic foods, as well as related certifications, labeling and inspections are closely monitored by consumers [89].

Several findings show that knowledge is positively linked to consumers' attitude towards organic food, which further influences their purchase intention and purchase behavior [90,91]. These studies, therefore, have suggested that increased knowledge will enable consumers to have more information and increase the possibility of high purchase intention.

For this reason, according to Stutzman and Green [89] we consider knowledge as an antecedent variable influencing consumer attitude towards consumption behavior. The related hypothesis is formulated as follows:

H3. Organic product knowledge positively affects purchase intention of organic products

Subjective norm (SN). This construct refers to the individual's perception about a specific behavior, which is influenced by significant others' judgement and opinions. Subjective norm includes pressure from peers, family or the society as a whole, such as the opinions of relatives, parents, partners, close friends, teachers, colleagues, opinion leaders on newspaper, media or social-media. Similar elements influence an individual's decision-making process and the intention whether or not to take action [27].

Usually, the subjective norm construct has a direct impact on consumers' purchasing intentions and behaviors. In particular, attitudes and behaviors of individuals in economically and socially developed countries are highly correlated with subjective norms, and this also applies to organic food purchase and consumption behavior [61,67,70]. For this reason, we can suggest the following hypothesis:

H4. Subjective norm positively affect purchase intention of organic products

Green consciousness (GC). The green consciousness construct reflects the attitude of individuals towards environmental protection and conservation [93]. According to Newton et al. [94], rather than directly influencing buying intentions and actual decisions, the generic consideration for environmental issues might support consumers' comprehension and assessment of the effects of their purchase decisions on the environment and the ecosystems. Other authors have explored collectivists' pro-environmental focus, and highlighted its actual influence on buying intentions [95]. In fact, collectivists value society and the common good more than the individual, and are therefore more inclined to feel empathy, indebtedness, and similar emotions [59]. Studies by Magnusson et al. [59,68], Zanolli and Naspetti [16], Padel and Foster [60], Krystallis et al. [84] and several other authors find that transcendental values such as universalism and benevolence are more important to regular organic food consumers than to occasional organic food consumers [66]. For this reason, the following hypothesis is drawn:

H5. Green consciousness positively affects purchase intention of organic products

Perceived product quality (PQ). Product quality, which includes a plurality of attributes, such as sensory qualities, good appearance and smell, is among the factors that increase consumers' positive attitude [66]. Roddy et al. [94], Schifferstein and Oude Ophuis [86], McEachern and McClean [97], and Fotopoulos et al. [98], who studied the behavior of consumers in Ireland, the Netherlands, Scotland and Greece, respectively [66], highlight the pivotal role of taste in organic food buying decisions. Kihlberg and Risvik [99] found that the majority of organic consumers think that organic food tastes better than conventional. Zanolli and Naspetti [16] reported that Italian consumers of organic products associate organic food to health at different levels of abstraction, and they search for good, tasty and nourishing products, being pleasure and well-being among their core values. For this reason, the following hypothesis is drawn:

H6. Perceived quality positively affects purchase intention of organic products

Perceived behavioral control (PBC). In this study we decide not to include the PBC. PBC refers to people's perceptions of the easiness or difficulty of performing the behavior of interest (Ajzen, 1991), and it is considered to be a suitable proxy for actual control [27].

In the case of complete control over behavior, PBC is an antecedent of intention, and intention alone predicts the behavior, while, when the behavior does not completely fall under the person's volitional control, it may predict behavior directly [27]. The strength of the association between PBC and intention varies across studies.

According to some authors, PBC had a significant impact on the intention to buy organic food (e.g. [23,75]); on the contrary, some studies found that the effect of PBC was not significant (e.g. [70,72]). In the meta-analysis by Scalco et al. [76], PBC seemed to play a minor role, if compared to attitude and subjective norm, with respect to intention prediction. This heterogeneity of results may be linked to both the degree of availability of organic food in different contexts and dissimilarities in the selection of construct measurement items.

Preliminary trial findings, the market knowledge that highlights a wide diffusion of organic products [7] and the results of previous studies suggest that PBC should be limited to specific socio-economic constraints. In particular, low individual income and high organic food prices can represent the main barriers negatively affecting the individual's ability to transform her/his purchase intention into actual behavior and consumption. Economic factors, such as income and prices, typically constitute the explicit variable of the demand function, while this study focuses on the latent determinants influencing consumer behavior towards organic food.

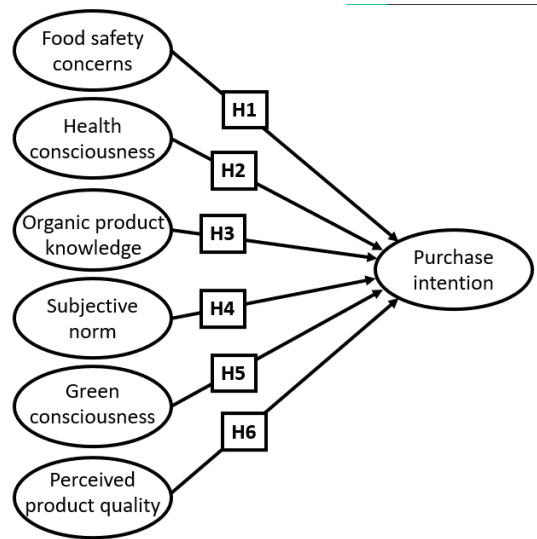
For these reasons, we decide to not include PNC in our TPB model.

Purchase Intention (PI). In our model, the behavioral intention (BI) is explicitly indicated as "Purchase Intention" (PI). The construct is linked with its antecedents through specific items, such as "Guarantees of control" (FS), "Attention to my health" (HE), "Knowledge of the product" (K), "Influence of family and friends" (SN), "Requirements for environmental protection" (GC), "Appreciation for the quality of the products" (PQ). These items allow to test the coherence of the respondents' answers. (see Appendix A). For this reason, the following hypothesis is drawn:

H7. Purchase Intention positively affect Behavior

The proposed causal model is graphically displayed in Figure 2.

Fig.2: proposed BTP model – version 1 (6 exogenous latent constructs)



Following the conceptual structure described above, our analysis relies on 7 constructs (6 exogenous latent variables), each described through measurement scales (Table 1) (see Appendix A for the full list of constructs and items).

Table 1. Latent Constructs and items

Latent Constructs	Labels	Number of items
Food Safety concerns	FS	7
Health Consciousness	HC	6
Organic product Knowledge	K	5
Subjective Norm	SN	7
Green Consciousness	GC	7
Perceived Quality	PQ	5
Purchase Intention	PI	7

In order to gather quantitative data, a structured, anonymous questionnaire was designed, including socio-demographic variables and the measures of the TPB model. Interviewees were asked to measure each construct item using a 5-point Likert-like scale, ranging from 1 (Strongly disagree) to 5 (Strongly agree). The questionnaire typically took 20–30 min to complete.

Specifically trained interviewers helped participant complete the survey through face-to-face interviews. Participants were not offered an honorarium in exchange for their response and time. The questionnaires were distributed among consumers in Italy in a primary interview round between summer 2017 and the beginning of 2018. A preliminary analysis was carried out in this first step of the survey, whose results were presented and discussed at a conference [100]. At a later stage, the dataset was improved, questionnaires with lacking answers were discarded, and additional ones were collected during 2019. The final dataset included 600 complete and usable questionnaires.

Structural equation modelling (SEM) was then used to test the model represented in Figure 2. SEM may be considered as an extension of multiple regression, combining this statistical technique with (confirmatory) factor analysis (CFA). SEM allows for the specification of model structure with both latent and observed variables; in fact, latent varia-

bles, i.e., abstract phenomena that cannot be directly measured by the researcher, are analyzed through CFA, often referred to as the measurement model [100]. Such an approach is typically followed when the researcher has some knowledge of the underlying latent variable structure or wishes to evaluate a priori hypotheses driven by theory.

Relations between the latent variables identify the structural model. SEM allows to examine the influence of multiple variables on other multiple variables at once, according to a specified model. In SEM, endogenous latent variables (i.e., dependent variables) are influenced by the exogenous variables of the model either directly or indirectly, i.e., mediated by other (endogenous) variables. In other words, variations in the exogenous latent variables (i.e., independent variables) result in value fluctuations of other endogenous latent variables of the model [101]. Following this approach, the whole TPB can be tested in relation to the dataset in one analysis [102].

The SEM analysis was carried out in the following two steps.

Step 1: 6 - Exogenous latent Constructs in SEM

The findings of this first step of the analysis (see Results section) suggest that the Food Safety Concerns (FS), Green Consciousness (GC) and Perceived Quality (PQ) constructs were the most relevant variables positively affecting Purchase Intention (PI), while Health consciousness (H), Organic Product Knowledge (K) and Subjective Norm (SN) showed limited influence on the consumer Purchase Intention (PI).

Step 2: 3 - Exogenous latent Constructs in SEM

A second structural equation model was tested focusing on the three most relevant constructs, that are Food Safety Concerns (FS), Green Consciousness (GC) and Perceived Quality (PQ). The results confirmed the relevance of the multiple items explaining the latent variables that determine the intentions to purchase organic products (see Results section).

3. Results

Table 2 summarizes the main characteristics of the sample. Most participants came from the Friuli-Venezia Giulia region, in the northeast of Italy. About 60% of the respondents were female, and over 40% of them were older than 40 years old when interviewed. Regarding educational attainment, almost half of the interviewees had a high school diploma, and over 40% held a university degree, either bachelor's or master's degree. More than 42% of them were employed, while a quarter of the sample was composed of students. Their average household size was three members, counting about 1.5 children or grandchildren. Family incomes ranged between 1,000 and 3,000 euros per month.

Table 2. Characteristics of the sample

Characteristics	Categories	%
Gender	Female	60.03
	Male	39.97
Age (years)	18–20	2.17
	21–24	14.83
	25–29	21.83
	30–40	14.83
	≥ 40	46.17
Education	Primary school	0.17
	Lower secondary school	6.83
	High school	49.67
	Bachelor's degree	17.88
	Master's degree	23.80
	Other	2.67
Employment	Entrepreneur	3.67
	Farmer	8.33
	Employee	42.17
	Self-employed	5.50
	Pensioner	5.00
	Housewife	5.17
	Student	24.67
	Unemployed	2.83
	Other	2.67
Number of people per household	1	12.67
	2	21.50
	3	22.83
	4	33.00
	≥ 5	10.00
Number of children or grandchildren per household	0	30.50
	1	28.33
	2	31.00
	≥ 3	10.17
Family income per month	No answer	2.33
	< 1,000	4.00
	1,000–1,999	25.33
	2,000–2,999	34.67
	3,000–3,999	18.17
	≥ 4,000	15.50

The main traits of the participants' organic food consumption routines are summarized in Table 3. The results show that some 80% of the participants in this study are generally keen to choose organic food (i.e. the sum of interviewees who declare to buy organic food either occasionally, or often, or whenever possible).

The most frequently purchased products are "vegetables", "fruit", "olive oil", "cereal", "milk, yogurt and probiotics" and "bakery products", and almost 25% of the interviewees used to buy similar products "often" or "always, where possible". The prevailing purchase channels are "large distribution centres" (47%), "specialised shops" (23%), "producers" (15%) and "retailers" (14%).

Table 3. Organic food consumption habits

Frequency of purchases	No answer	1.33
	Never	3.50
	Rarely	15.83
	Occasionally	32.17
	At least once a week	19.33
	Almost every day	21.50
	Always, where possible	6.33
	% of "often" or "always" answers $\geq 25\%$	
Most frequently purchased products	Vegetables	52.00
	Fruit	49.00
	Olive oil	48.50
	Cereals	38.50
	Milk, yogurt and other milk derivatives	35.17
	Bakery products	29.17
	% of "often" or "always" answers $\geq 25\%$	
Purchase channels	Large distribution centres	47.33
	Specialised shop	23.00
	Producer	15.00
	Retailer	14.17

As suggested by Byrne [101], Hankins et al. [102], Anderson and Gerbing [103], CFA was performed to determine whether all items would appropriately reflect their underlying latent constructs.

The primary objective of CFA is to determine the ability of a predefined factor model to fit an observed set of data. The reliability of each construct was positively analysed through Cronbach's α coefficients, which indicated a good level of internal consistency, while the average variance extracted (AVE) confirmed the convergent validity of the constructs (Table 4a, 4b, 4c).

Table 4a. Confirmatory factor analysis of the constructs

Latent constructs	Labels	α	AVE
Food safety concerns	FC	0.80	0.57
Health consciousness	HC	0.76	0.40
Organic product knowledge	K	0.70	0.35
Subjective norm	SN	0.70	0.40
Green consciousness	GC	0.85	0.46
Perceived quality	PQ	0.82	0.49

Table 4b. Confirmatory factor analysis of the constructs - in order of relevance (α)

Latent Constructs	Labels	α	AVE
Green consciousness	GC	0.85	0.46
Perceived quality	PQ	0.82	0.49
Food safety concerns	FS	0.80	0.57
Health consciousness	HC	0.76	0.40
Organic product knowledge	K	0.70	0.35
Subjective norm	SN	0.70	0.40

Table 4c. Confirmatory factor analysis of the constructs - in order of relevance (AVE)

Latent Constructs	Labels	α	AVE
Food safety concerns	FS	0.80	0.57
Perceived quality	PQ	0.82	0.49
Green consciousness	GC	0.85	0.46
Health consciousness	HC	0.76	0.40
Subjective norm	SN	0.70	0.40
Organic product knowledge	K	0.70	0.35

The results demonstrate that, based on both the Cronbach's α coefficients and the AVE, the constructs named "Food safety concerns", "Green consciousness" and "Perceived quality" show the highest internal consistency in explaining their influence on consumer behavior.

Tables 5a-5g show the more relevant constructs and items of the six constructs adopted in the model, with Λ greater than 0.5.

Table 5a. Confirmatory factor analysis (6 constructs)

Constructs and items	Mean	Standard deviation	Λ	α	AVE
<i>Food safety concerns (FS)</i>				0.80	0.57
Organic products are safer because they do not contain chemical residues.	3.63	0.86	0.89		
Organic products are safer because they are obtained without the use of growth hormones and antibiotics.	3.90	0.74	0.77		
Organic products are safer because they do not contain additives.	3.48	0.91	0.87		
Organic products are safer because they do not use GMO crops.	3.64	0.90	0.87		
Organic products are safer because they are obtained from a less polluted natural environment.	3.44	0.98	0.70		
Organic products are more controlled.	3.54	0.87	0.70		
Organic farmers pay more attention to production methods.	3.85	0.71	0.56		

Table 5b. Confirmatory factor analysis (6 constructs)

Constructs and items	Mean	Standard deviation	Λ	α	AVE
<i>Health consciousness (HC)</i>				0.76	0.40
Organic products contain more nutrients (proteins, etc.).	2.82	0.96	0.87		
Organic products contain more vitamins and minerals.	2.99	0.99	0.86		

Table 5c. Confirmatory factor analysis (6 constructs)

Constructs and items	Mean	Standard deviation	Λ	α	AVE
<i>Organic product knowledge (K)</i>				0.70	0.35
Scientific evidence proves that organic products are better for human health.	3.45	0.77	0.61		
Doctors recommend the consumption of organic products.	3.01	0.88	0.66		
Nutritionists recommend the consumption of organic products.	3.38	0.84	0.70		

Table 5d. Confirmatory factor analysis (6 constructs)

Constructs and items	Mean	Standard deviation	Λ	α	AVE
<i>Subjective norm (SN)</i>				0.70	0.40
In my family, we have always consumed organic products, so it is a well-established habit.	2.76	1.11	0.69		
In my family, we buy organic products because some members (wife, children, etc.) want them.	3.20	1.11	0.74		
In my family, we buy organic products because some members (wife, children, etc.) are convinced supporters of organic farming.	2.83	1.15	0.90		

Table 5e. Confirmatory factor analysis (6 constructs)

Constructs and items	Mean	Standard deviation	Λ	α	AVE
<i>Green consciousness (GC)</i>				0.85	0.46
Organic production protects the environment.	3.85	0.75	0.78		
Organic products protect the environment because they do not use chemicals.	3.86	0.72	0.77		
Organic production protects the environment and biodiversity because it does not use GMO crops.	3.70	0.80	0.69		
Organic production protects the environment and biodiversity because it follows natural production processes.	3.78	0.75	0.70		
Organic production is more respectful of animal welfare.	3.76	0.80	0.69		
Organic farmers have more expertise in environmental matters.	3.30	0.89	0.54		
Organic production reduces the production of greenhouse gases.	3.27	0.77	0.52		

Table 5f. Confirmatory factor analysis (6 constructs)

Constructs and items	Mean	Standard deviation	Λ	α	AVE
<i>Perceived quality (PQ)</i>				0.82	0.49
Organic products have a superior quality.	3.70	0.84	0.68		
Organic products are tastier.	3.42	0.93	0.78		
Organic products have authentic taste.	3.30	0.99	0.75		
Organic products have more natural fragrance.	3.26	0.90	0.77		
Organic products are fresher and better preserved.	2.76	0.93	0.43		

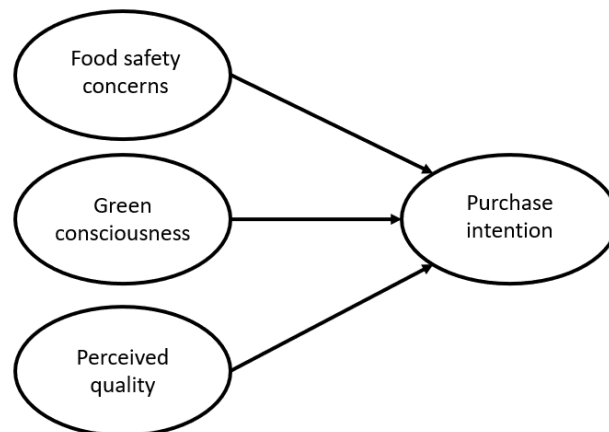
Table 5g. Structure of exogenous latent constructs

Latent Constructs	Labels	Number of items	Number of items with $\Lambda > 0.5$
Food Safety concerns	FS	7	7
Health Consciousness	HC	6	2
Organic product Knowledge	K	5	3
Subjective Norm	SN	7	3
Green Consciousness	GC	7	7
Perceived Quality	PQ	5	5

The 3 most relevant exogenous latent constructs “Food safety concerns”, “Green consciousness” and “Perceived quality” present, respectively 7, 7 and 5 items with coefficient $\Lambda > 0.5$, equal to the 100% of the item included in the constructs. Otherwise “Health consciousness”, “Organic product knowledge” and “Subjective norm” show 2, 3 and 3 items with parameters above this threshold, with a overall percentage less than the 50% of the total item included in the three constructs (8 items with coefficient $\Lambda > 0.5$. on the 18 total items considered).

According to these preliminary results, the theoretical model was updated with the sole inclusion of the 3 most relevant exogenous latent constructs, as represent in Figure 3.

Figure 3 - proposed TPB model – version 2



Tables 6a-6c show the updated model results. The analysis of the Λ coefficients affirms the superior performance and validity of this alternative model. Table 6.d illustrates resulting coefficients of the PI construct items.

Table 6a. Confirmatory factor analysis (3 constructs)

Constructs and items	Mean	Standard deviation	Λ	α	AVE
<i>Food safety concerns</i>				0.80	0.57
Organic products are safer because they do not contain chemical residues.	3.63	0.86	0.71		
Organic products are safer because they are obtained without the use of growth hormones and antibiotics.	3.90	0.74	0.66		
Organic products are safer because they do not contain additives.	3.48	0.91	0.60		
Organic products are safer because they do not use GMO crops.	3.64	0.90	0.65		
Organic products are safer because they are obtained from a less polluted natural environment.	3.44	0.98	0.48		
Organic products are more controlled.	3.54	0.87	0.53		
Organic farmers pay more attention to production methods.	3.85	0.71	0.55		

Table 6b. Confirmatory factor analysis (3 constructs)

Constructs and items	Mean	Standard deviation	Λ	α	AVE
<i>Green consciousness</i>				0.85	0.46
Organic production protects the environment.	3.85	0.75	0.76		
Organic products protect the environment because they do not use chemicals.	3.86	0.72	0.76		
Organic production protects the environment and biodiversity because it does not use GMO crops.	3.70	0.80	0.70		
Organic production protects the environment and biodiversity because it follows natural production processes.	3.78	0.75	0.71		
Organic production is more respectful of animal welfare.	3.76	0.80	0.69		
Organic farmers have more expertise in environmental matters.	3.30	0.89	0.56		
Organic production reduces the production of greenhouse gases.	3.27	0.77	0.53		

Table 6c. Confirmatory factor analysis (3 constructs)

Constructs and items	Mean	Standard deviation	Λ	α	AVE
<i>Perceived quality</i>				0.82	0.49
Organic products have a superior quality.	3.70	0.84	0.71		
Organic products are tastier.	3.42	0.93	0.76		
Organic products have authentic taste.	3.30	0.99	0.77		
Organic products have more fragrance.	3.26	0.90	0.74		
Organic products are fresher and better preserved.	2.76	0.93	0.44		

Table 6d. Confirmatory factor analysis (3 constructs)

Constructs and items	Mean	Standard deviation	Λ	α	AVE
<i>Purchase intention</i>				0.81	0.40
The guarantees of control over production positively influence my intention to buy organic products.	3.62	0.85	0.69		
My attention to my health positively influences my intention to buy organic products.	3.84	0.84	0.77		
My intention to buy organic products can increase with real knowledge of organic farming.	3.88	0.76	0.61		
My family and friends' willingness to buy organic products can positively influence my intention to buy organic products.	3.24	1.04	0.49		
Political decisions can increase my intention to buy organic products.	2.64	1.08	0.35		
The requirements for environmental protection positively influence my intention to buy organic products.	3.86	0.83	0.66		
My intention to buy organic products can increase with my appreciation for the quality of the products.	3.94	0.87	0.58		

Overall, the findings indicate that the proposed measurement scales generally well describe the selected latent constructs. Almost all the items used to describe the FS, GC and PQ constructs present Λ coefficients greater than 0.5. Similarly, the results confirm the good performance of the measurement scales used to describe the PI construct items.

The analysis conducted with LISREL 9.20 allowed to test the hypotheses of the proposed model. The fit indexes of the model are produced in order to verify how well the hypothesized model reproduces the observed covariance matrix, using the Goodness of Fit Index (GFI) and Adjusted Goodness of Fit Index (AGFI), both proposed by Jöreskog and Sörbom [104] the incremental fit indexes (Normed Fit Index (NFI) proposed by Bentler and Bonnet [105], the Non-normed Fit Index (NNFI), as proposed by Bollen [106], the Comparative Fit Index (CFI, proposed by Bagozzi, [107]), the Root Mean Square Error of Approximation (RMSEA, proposed by Browne and Cudek [108]). The results indicated a good fit between the model and the observed data and allow for analysis of the assumptions of the hypothesis. The incremental fit indexes give an indication of good adaptation of the conceptual model, respectively, 0.95 for NFI, 0.96 for NNFI, and 0.96 for the CFI. Shifting attention to the RMSEA, the value of 0.06 is a good indicator of adaptation (see Table 7).

Table 7 - Global fit indexes

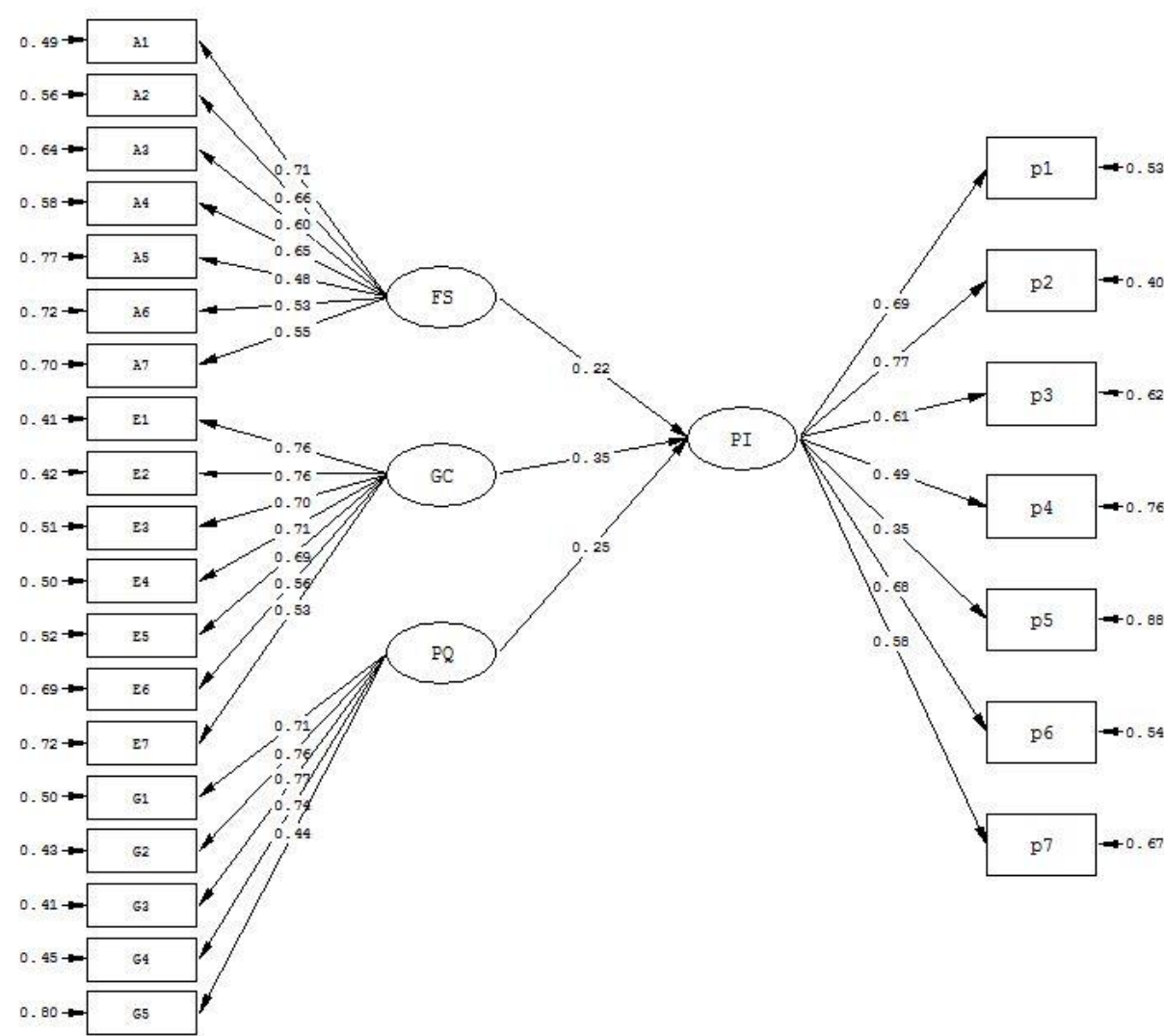
Global fit indexes	Value	df
GFI	0.89	
AGFI	0.88	
NFI	0.95	
NNFI	0.96	
CFI	0.96	
RMSEA (Test of Close Fit)	0.059	
χ^2	913.41	293
χ^2/GDL	3.1	

The existence of direct causal effects between the latent variables FS, GC, PQ and PI are confirmed by the fit indexes proposed by SEM analysis. Supporting these hypotheses, the model depicts consumers' purchase intention, mostly affected by green consciousness and environmental sustainability of organic products (see Table 8). Figure 4 displays the path analysis of the whole set of relationships among the model constructs and includes corresponding parameter statistical standardized estimations.

Table 8 - Direct causal effects

Hypothesis	Estimate (Standardized)	s.e.	t
Direct effects			
(H1) FS→PI	0.22	0.07	2.94
(H2) GC→PI	0.35	0.07	4.66
(H3) PQ→PI	0.25	0.05	4.33

Figure 4 – Path analysis



4. Discussion

In the light of the analysis and the results, the model unravels the relative importance of the green consciousness, which seems to have a positive influence on organic food purchase intention, in particular because of general protection of the environment, non-use of chemical input, and adoption of natural production processes.

In addition to this, our analysis reveals the collateral importance of concerns about food safety and the role of perceived product quality, with each of them explaining more than 20% of variations in behavioral intention to buy and consume organic foods, according to the results. In spite of its overall adequate performance and explanatory power, the suggested model is not able to completely capture, explain and describe the complex set of motivations and psychological dynamics which contribute to build consumers' behavioral intention to choose organic food products. The scrutiny of the literature, Vermeir and Verbeke in particular [62], suggests to track back and reconnect missing information to the final factor, that is perceived behavioral control. Alternative explanations may be linked to the existence of further correlations between antecedent constructs that the adopted model is not able to attribute to a specific construct, as well as to additional, intrinsic problems related to the questionnaire or the survey method. Eventually, the approach presented in the paper should be read as one of, and together with, the many alternative cognitive methods, which individually provide partial interpretations of a complex and multidimensional phenomenon. In this sense, our model best fits the role of a decision support tool, rather than that of a complete, exact consumer behavior theory. The reliability of the answers and their consistency should also be also evaluated in probabilistic terms, not as deterministic variables.

In any case, our results confirm, or do not appear to invalidate, previous findings on Italian consumers' behavior, resulting from applications of the TPB, choice experiments or other theoretical and methodological approaches [9,10,15,16,20,24,37,52,54,65,76].

Finally, the results suggest that unveiling and measuring consumers' psychological processes related to the perception of organic food products is crucial, as these will eventually determine their intention to buy and consume such items. This is a vital information for both the operators in the organic agri-food supply chain, whose communication efficacy heavily depends on the capacity to identify and leverage on consumers' values, and policy makers, whose understanding of people's needs and perception of food and supply chain quality and safety is essential to produce informed and rational regulations.

Notwithstanding the explanatory power of our model, and the implications of this study, it is still intended as a preliminary approach to the analysis of organic food consumers and to the potential and extensive applications of SEM in similar cases and contexts. The geographical boundaries of the research, mainly focused on Friuli-Venezia Giulia region and local residents, as well as potential biases in sample selection, related to the engagement of consumers at selected organic food shops, may not fully reflect the demographics of the target population, hence limit extension and generalization of the results.

Given these premises, future research should rely on better sampling techniques (e.g., stratified random sampling) to increase the sample size and its representativeness, for example eliciting participants in other regions as well.

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Appendix A

Questionnaire.

Constructs and items (Section 1)	Labels
<i>Food safety concerns</i>	<i>FS</i>
Organic products are safer because they do not contain chemical residues.	FS.1
Organic products are safer because they are obtained without the use of growth hormones and antibiotics.	FS.2
Organic products are safer because they do not contain additives.	FS.3
Organic products are safer because they do not use genetically modified crops.	FS.4
Organic products are safer because they are obtained from a less polluted natural environment.	FS.5
Organic products are more controlled.	FS.6
Organic farmers pay more attention to production methods.	FS.7
Constructs and items (Section 2)	Labels
<i>Health consciousness</i>	<i>H</i>
Organic products are obtained with traditional methods and therefore healthier.	H.1
Organic products are minimally processed by the food industry and therefore healthier.	H.2
Organic products are more dietary, so they are fat-free.	H.3
Organic products contain more nutrients (proteins, etc.).	H.4
Organic products contain more vitamins and minerals.	H.5
Organic products are better for those suffering from food allergies and intolerances.	H.6
Constructs and items (Section 3)	Labels
<i>Organic product knowledge</i>	<i>K</i>
Scientific evidence proves that organic products are better for human health.	K.1
Doctors recommend the consumption of organic products.	K.2
Nutritionists recommend the consumption of organic products.	K.3
I know the legislation on organic production; therefore, I trust these products.	K.4
I have visited organic farms, and I trust their production system.	K.5

Constructs and items (Section 4)	Labels
<i>Subjective norm</i>	<i>SN</i>
In my family, we have always consumed organic products, so it is a well-established habit.	SN.1
In my family, we buy organic products because some members (wife, children, etc.) want them.	SN.2
In my family, we buy organic products because some members (wife, children, etc.) are convinced supporters of organic farming.	SN.3
In my family, we buy organic products because we have been convinced by our acquaintances and friends	SN.4
The consumption of organic products is a trendy phenomenon.	SN.5
Stores that specialise in organic products provide better service.	SN.6
Organic production represents the future of agriculture.	SN.7
Constructs and items (Section 5)	Labels
<i>Green consciousness</i>	<i>GC</i>
Organic production protects the environment.	GC.1
Organic products protect the environment because they do not use chemicals.	GC.2
Organic production protects the environment and biodiversity because it does not use genetically modified crops.	GC.3
Organic production protects the environment and biodiversity because it follows natural production processes.	GC.4
Organic production is more respectful of animal welfare.	GC.5
Organic farmers have more expertise in environmental matters.	GC.6
Organic production reduces the production of greenhouse gases.	GC.7
Constructs and items (Section 6)	Labels
<i>Perceived quality</i>	<i>PQ</i>
Organic products have a superior quality.	PQ.1
Organic products are tastier.	PQ.2
Organic products have authentic taste.	PQ.3
Organic products have more natural fragrance.	PQ.4
Organic products are fresher and better preserved.	PQ.5

Constructs and items (Section 7)	Labels
<i>Purchase intention</i>	<i>PI</i>
The guarantees of control over production positively influence my intention to buy organic products.	PI.1
My attention to my health positively influences my intention to buy organic products.	PI.2
My intention to buy organic products can increase with real knowledge of organic farming.	PI.3
My family and friends' willingness to buy organic products can positively influence my intention to buy organic products.	PI.4
Political decisions can increase my intention to buy organic products.	PI.5
The requirements for environmental protection positively influence my intention to buy organic products.	PI.6
My intention to buy organic products can increase with my appreciation for the quality of the products.	PI.7

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