



## Article

# Environmental and Health Factors as Organic Fruit Purchase Drivers and the Mediating Role of Price and Effort

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**Abstract:** This article analyzes the organic fruit consumption behavior associated with environmental and health care. The literature review focused on the relationship between attitudes and perceptions of health care through the organic food consumption, and on the other hand, the association between the organic products consumer behavior and environmental care. The methodology included a theoretical relationship model proposed, considering different constructs provided by previous literature to measure motivations, fears and attitudes associated with the intention to purchase organic fruit, once the methods that confirm their validity and reliability were applied to evaluate seven direct relationship hypotheses, three indirect relationship hypotheses and two moderation hypotheses. As result, nine hypotheses are supported, being health and environmental motivations drivers of the attitude towards organic fruit and the intention to purchase organic fruit, intention that is reinforced by the positive attitude towards these foods but is moderated by the perceived price and the purchase effort.

**Keywords:** consumer behavior; fruit consumer; organic fruit; healthy behavior; pro-environmental behavior; sustainable business



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## 1. Introduction

The perception of organic fruits depends on consumers' experiences with the product, and in the case of fruits these are distinguished as healthy, nutritious, attractive, and tasty. The price, the consumption culture and the preparation diversification are also considered as important aspects [1–3]. In the case of preferences for organic products, given their nutritional properties, the information that labels can provide, such as the specifications and healthy qualities of the food, acquires a special value, especially for young and informed consumers [4–7].

The healthy benefits of organic fruit are mainly reflected by its contribution to dietary adjustments, given its efficiency in weight control, with a long-term consumption, which becomes more necessary as people grow older [6–9]. Considering the nutritional contributions provided by organic fruits, consumers prefer this healthy food, as occurs with the positive attitude in the case of the Mediterranean diet. Another aspect that influences a favorable attitude and the intention to purchase these foods are the governmental promotion policies and an easy access to these products' distribution channels [10–16].

This understanding of the positive health effects of consuming organic fruits compared to non-organic fruits is one of the factors driving consumers to purchase them [17–26]. It

becomes possible to segment the organic fruit consumer market into consumers informed about the organic food properties, as well as their search for variety and quality [27,28].

In this regard, organic certification can contribute to improving this product awareness, although studies show that consumers are still poorly informed about the certification types and their benefits. These advances in organic fruit labeling and packaging have a positive value in increasing food diversification [22,29–31]. In addition, the organic food consumption has a positive impact on the environmental care, which contributes to the waste reduction due to the new technologies that benefit the processing and reuse of food, mitigating the effects of climate change and generating local economies for the communities [23,32–37]. On the other hand, conventional foods usually have high sugars, artificial flavors, and colorings compared to healthy menus that have beneficial properties such as high fiber content and omega 3. Thus, among the main benefits that drive the healthy food consumption is the health risk reduction in diabetes, cholesterol, and heart problems, in addition to the freshness properties reported through organic labels and the variety of products for consumption at farmers' markets [17,22,24,32,38,39]. A major consumer concern is the pesticide effects on non-organic fruit and their impacts on health and the environment, encouraging decisions to purchase organic fruit [20,40].

Also, the non-availability of nutritious products is perceived by consumers, with taste, portion size and accessibility being factors that impede the healthy food consumption in the adult population. In addition, there is widespread inexperience with organic products, the information dissemination on labels, the pesticide use, shopping places, ease of purchasing products in their current markets, irregular supply from certified suppliers and perishable nature, causing confusion in the appropriate prices to be paid for these foods [21,27,29,38,41,42].

Finally, price awareness is another important factor that can inhibit or trigger the organic fruit consumption, being sensitive to the current economic crisis and the sanitary effect due to COVID-19. The benefits of consuming organic products and the differentiation of these products in the market are the most effective ways to increase their consumption.; [27,28,30,43,44].

Therefore, we propose a conceptual relationship model whose hypotheses (H1–H12) can be seen in Figure 1.

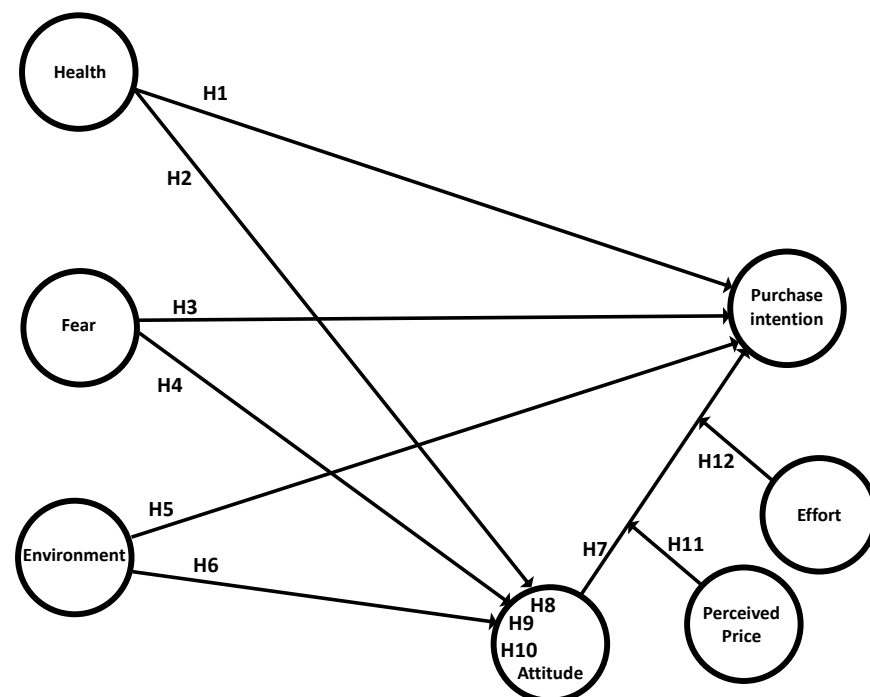


Figure 1. Theoretical proposed relationship model.

Figure 1 contains in detail direct relationship hypotheses: H1, H2, H3, H4, H5, H6. Indirect mediated relationship hypotheses: H8, H9 and H10. Moderation hypotheses: H11 and H12.

Direct relationship hypothesis:

**H1.** *Health has a positive impact on organic fruit purchase intention.*

**H2.** *Health has a positive impact on attitude towards organic fruit.*

**H3.** *Consumer fear towards conventional products has a positive impact on purchase intention for organic fruit.*

**H4.** *Consumer fear towards conventional products has a positive impact on attitude towards organic fruit.*

**H5.** *Environmental motivations have a positive impact on the intention to purchase organic fruit.*

**H6.** *Environmental motivations have a positive impact on attitude towards organic fruit.*

**H7.** *Positive attitude toward organic fruit has a positive impact on purchase intention.*

Indirect relationship hypothesis:

**H8.** *The relationship between consumer fear and purchase intention is mediated by attitude toward organic fruit.*

**H9.** *The relationship between health and purchase intention is mediated by attitude toward organic fruit.*

**H10.** *The relationship between environmental motivations and purchase intention is mediated by attitude toward organic fruit.*

Moderation hypothesis:

**H11.** *The attitude toward organic fruit effect on purchase intention is moderated by perceived price. Thus, the higher the perceived price, the greater the attitude effect on purchase intention.*

**H12.** *The attitude effect toward organic fruit on purchase intention is moderated by effort. Thus, the greater the effort, the greater the attitude effect on purchase intention.*

## 2. Materials and Methods

The measurement instrument used was selected through a previous systematic review work [45], which has contrasted among 184 papers published in Web of Science the model proposed by Jose & Kuriakose [25] (See Appendix A), to provide validity and reliability in the measurement, surpassing in statistical terms other reviewed articles that measure the organic fruit consumer behavior [20,40,46].

Thus, the Jose & Kuriakose [25] scale integrates the constructs that allow studying this consumption behavior, proposed by Scarpa & Thiene [47] (fear), Steptoe et al. [48] (health), Gil et al. [49] (environmental motivations), Steptoe et al. [48] (perceived price), Dickieson et al. [50] and Lichtenstein & Burton [51] (purchase effort). Finally, according to Jose & Kuriakose [25] for Attitude we asked about the importance assigned to organic fruit based on Magnusson et al., [52], and for purchase intention we used the item “who will buy organic fruit in the future” based on Ajzen [53].

The instrument was applied online in a self-reported mode (See Appendix A), in a population residing in the Santiago of Chile Province between April and May 2022, using a sampling procedure by convenience. Once the responses were collected, a first debugging analysis was carried out, going from an initial sample of 464 individuals to 458 (Data in Supplementary Materials, Table S1: OFCB2.xlsx). The sample obtained was composed of about 80% of people under 35 years of age. Most of them, approximately 53%, reported identifying with the female gender, while approximately 44% did so with the male gender. Eighty-three percent reported being single while approximately 16% reported being married. In terms of education level, almost 42% had university studies, 23% had

technical studies and 30% had secondary education. More than 40% had children under 12 years of age in the household. See Table 1.

**Table 1.** Sample description.

Variables	Frequency	Percentage
Under 26 years old	257	56.1
26 to 35 years old	109	23.8
36 to 45 years old	57	12.4
46 to 55 years old	30	6.6
Over 55 years old	5	1.1
Female	241	52.6
Male	203	44.3
I prefer not to say it	14	3.1
Married	74	16.2
Divorced	3	0.7
Single	380	83
Widowed	1	0.2
Primary/elementary education	10	2.2
Secondary education	132	28.8
Technical/professional higher education	104	22.7
University higher education	196	42.8
Masters Higher Education	9	2
Doctoral Higher Education	7	1.5
Presence of children at home	237	51.7
Presence of children under 12 years old	186	40.6

We then proceeded with the application of the Kolmogorov-Smirnov and Shapiro-Wilks tests, and the PLS-SEM analysis, as recommended by Hair et al. [54]. The procedure was performed using the statistical analysis application [55] SmartPLS v3.3.9, taking into consideration the research purpose and the sample particularities.

Thus, the general model was tested, which is shown in the Results section. Initially, for the evaluation of the measurement model, the outer loadings indicators were considered, the criterion used to be values equal to or greater than 0.7. On the other hand, in the AVEs, results above 0.5.

The cultural difference in the origin of the sample was considered, considering the differences between the Indian culture and the Chilean culture, from which the sample was extracted for this analysis, especially in terms of masculinity, indulgence, and long-term orientation [56], giving an opening to the statistical elimination of unsupported items.

Specifically, the variance-based SEM procedure was used, based on Partial Least Squares (PLS), to estimate the relationship between the constructs and their predictive powers proposed in the model [57,58]. The choice of this method was considered appropriate, considering a relatively small sample and non-normality in the data obtained [59,60]. Also, the PLS methodology has increased its use, given its technical advantages, in different areas, such as management, business and marketing [61,62].

The SmartPLS software, version 3.3.9 [55], was used for these analyses. Thus, the Dijkstra and Henseler [63] Consistent PLS algorithm procedure was used, considering relevant, given the reflective nature of the constructs considered, a maximum of 1000 iterations, a stopping criterion of  $1 \times 10^{-7}$  and centroid weighting scheme considering the existence of unidimensional constructs [64].

For measurement model evaluation, in terms of reliability and internal consistency, Cronbach's Alpha ( $>0.8$ ), Rho A ( $>0.7$ ) and composite reliability (CR,  $>0.7$ ) indicators were considered. Heterotrait-Monotrait analysis (HTMT,  $<0.9$ ) was also considered to assess discriminant validity [65]. To test discriminant validity, according to the criterion established by Fornell and Larcker [66], the correlation matrix was reviewed and compared

with the AVE square root. The AVE square root should be greater than the correlations associated with the construct from which the AVE is derived.

For structural model evaluation, the first step was to check for evidence of collinearity by means of the Variance Inflation Factors (VIF) statistic. Consistent PLS Bootstrapping analysis was used as a probabilistic approximation to the significance of the relationships expressed in the calculated model [63]. Thus, a total of 1000 randomized subsamples were calculated. Centroid’s Weighting Scheme was used again. with a maximum of 1000 iterations and a Stop Criterion of 7 [64].

To evaluate the moderating impact of the variables, regressions were used, using SPSS version 21 software and the macro-Process [67], scale reliability analyses were performed, as well as measurements of the interactions proposed in the hypotheses.

### 3. Results

The resulting model shows the validations of hypotheses 1 to 7 represented in Figure 2. With an R-squared determination coefficient of 0.660 for attitude towards organic products and 0.765 for purchase intention for these products. This means that preliminarily between health, fear, and environment, they would explain 66% of the variance of attitude; while between health, fear, environment, and attitude, they would explain 76.5% of the variance of purchase intention. Also, the results of the model suggest that the effects of fear on attitude and on purchase intention are too small and therefore not significant. To check this situation, some additional analyses will be carried out in the following items.

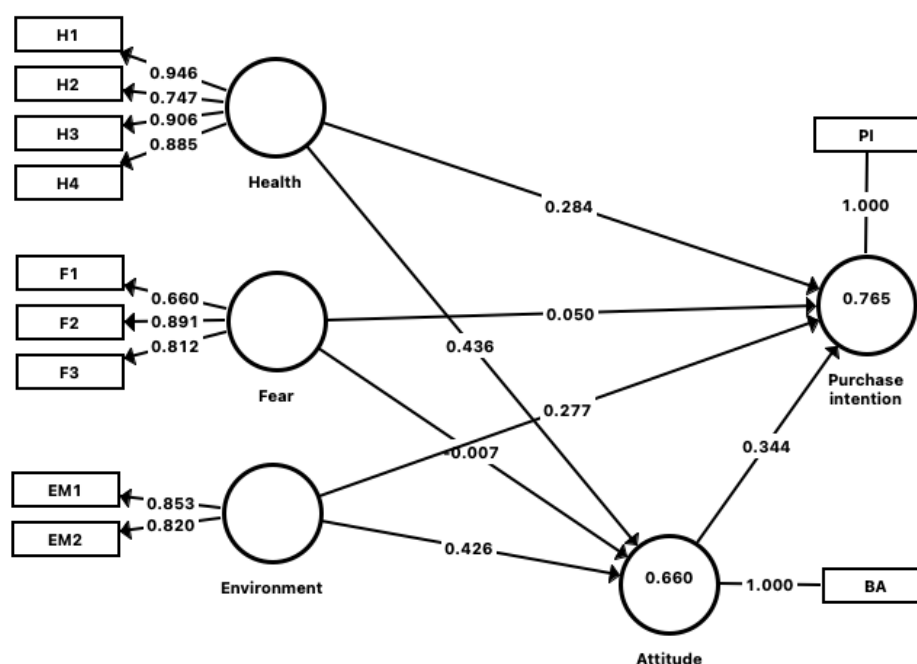


Figure 2. PLS path models results.

The Kolmogorov-Smirnov and Shapiro-Wilks tests yielded significance levels of 0.001, indicating that the sample distributions were not normal. Proceeding then to PLS-SEM analysis.

#### 3.1. Measurement Model Evaluation

The next step in the analysis corresponds to the review of the reliability, internal consistency, convergent validity, and discriminant validity indicators. It is worth mentioning that some variables were discarded for the final analysis of this model, since they presented inconsistencies in the fit of the model previously tested by Jose & Kuriakose [25].

For the measurement model evaluation, although the outer loadings criterion used were values equal to or greater than 0.7 for the fear case, this was maintained even when

the outer loading was 0.66, given the theoretical consistency of the item represented. On the other hand, the AVE calculated were all above 0.5. Thus, these results suggest convergent validity in the model (see Table 2).

**Table 2.** PLS-SEM assessment results of measurement models.

Factor	Indicators	Mean	SD	Loadings	AVE	Cronbach's Alpha	Rho A	CR
Attitude	BA	3.790	1.247	1.000	–	–	1.000	–
Environment	EM1	3.836	1.275	0.853	0.700	0.823	0.824	0.823
	EM2	3.869	1.320	0.820				
Fear	F1	3.120	1.314	0.660	0.629	0.830	0.849	0.834
	F2	3.546	1.316	0.891				
	F3	3.373	1.298	0.812				
Health	H1	3.998	1.232	0.946	0.764	0.927	0.934	0.928
	H2	3.651	1.283	0.747				
	H3	3.832	1.264	0.906				
	H4	3.838	1.243	0.885				
Purchase Intention	PI	3.889	1.260	1.000	–	–	1.000	–

SD: Standard Deviation, AVE: Average Variance Extracted, CR: Composite Reliability.

Table 3 reports that all HTMT values obtained are less than 0.9, suggesting that the constructs considered in the model have discriminant validity.

**Table 3.** Heterotrait—Monotrait ratio (HTMT).

Factor	Attitude	Environment	Fear	Health
Attitude	1.000			
Environment	0.770	0.837		
Fear	0.627	0.772	0.793	
Health	0.773	0.803	0.700	0.874
Purchase intention	0.808	0.808	0.678	0.807

In compliance with the criteria established by Fornell and Larker [66], the results, which can be seen in Table 4, suggest discriminant validity among the constructs considered in this model.

**Table 4.** Correlations between variables and AVE.

	Attitude	Environment	Fear	Health	Purchase Intention
Attitude	1.000				
Environment	0.770	0.837			
Fear	0.627	0.772	0.793		
Health	0.773	0.803	0.700	0.874	
Purchase intention	0.808	0.808	0.678	0.807	1.000

Average Variance Extracted (AVE) square root in the main diagonal.

### 3.2. Structural Model Evaluation

The results indicate that collinearity is not an issue for this data set under analysis. In addition, Tables 5 and 6 show the significance analyses of the direct and indirect effects, respectively. Thus, it is possible to confirm that the fear construct has no significant impact on attitude or purchase intention. The rest of the impacts given by environment and health

on purchase intention and attitude and the impact of attitude on purchase intention are significant. Thus, hypotheses 1, 2, 5, 6 and 7 are supported. While hypotheses 3 and 4 lack empirical support. On the other hand, as expected, the indirect effect of fear—attitude—purchase intention was not significant. While the effects of environment-attitude-purchase intention, and health-attitude-purchase intention were significant. Therefore, the results do not support H8, while they do support H9 and H10.

**Table 5.** Significance analysis of direct effects.

	Original Sample (O)	T Statistics ( O/SD )	p-Value	2.5%	97.5%
Attitude → Purchase intention	0.344	5.292	0.000 *	0.207	0.463
Environment → Attitude	0.426	3.991	0.000 *	0.232	0.661
Environment → Purchase intention	0.277	3.017	0.003 *	0.124	0.489
Fear → Attitude	−0.007	0.097	0.923	−0.138	0.125
Fear → Purchase intention	0.050	1.002	0.316	−0.044	0.148
Health → Attitude	0.436	5.196	0.000 *	0.251	0.574
Health → Purchase intention	0.284	3.680	0.000 *	0.129	0.436

SD: Standard Deviation, \*: p-value significantive.

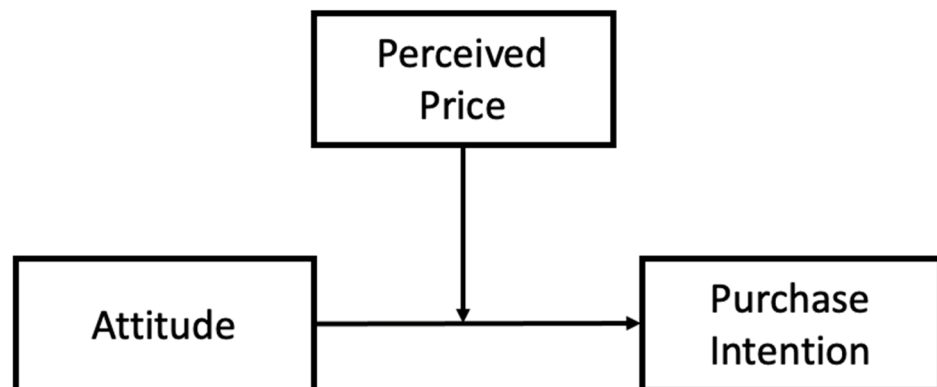
**Table 6.** Significance analysis of indirect effects.

	Original Sample (O)	T Statistics ( O/SD )	p-Value	2.5%	97.5%
Environment → Attitude → Purchase intention	0.146	3.465	0.001 *	0.072	0.230
Fear → Attitude → Purchase intention	−0.002	0.097	0.923	−0.050	0.044
Health → Attitude → Purchase intention	0.150	3.568	0.000*	0.065	0.230

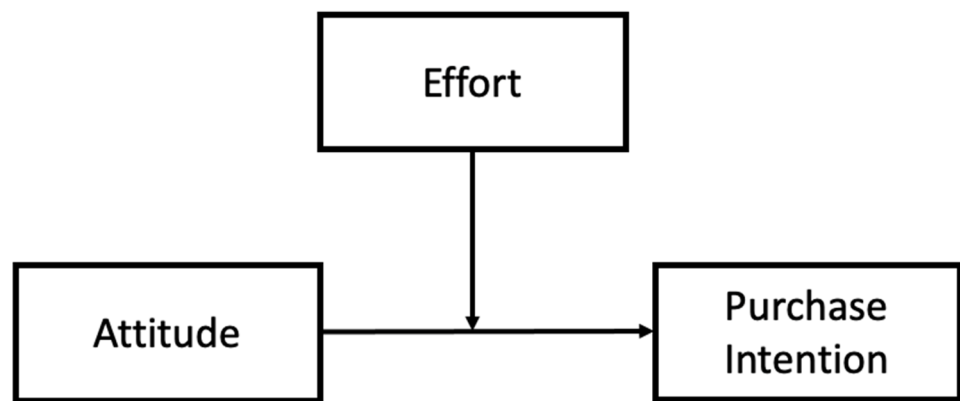
SD: Standard Deviation, \*: p-value significantive.

3.3. Moderate Effects Evalaution

The evaluation of perceived price and effort in the organic product acquisition. The graphical representation of the first model is shown in Figures 3 and 4.

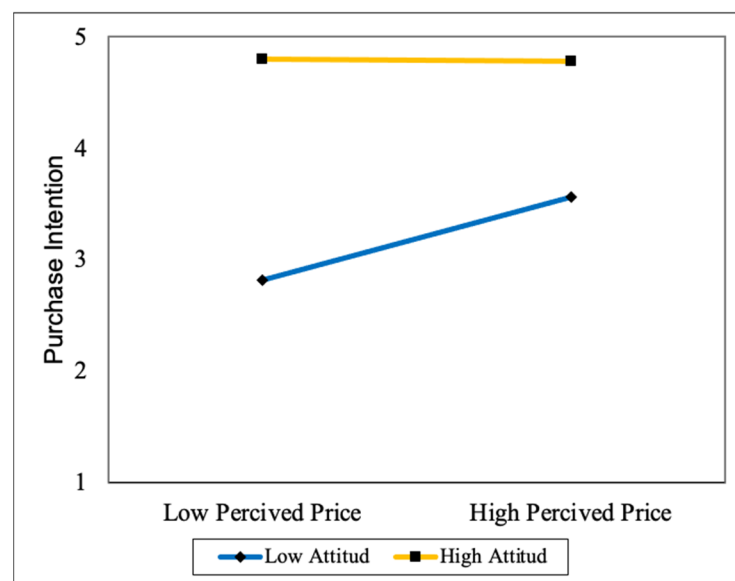


**Figure 3.** Price moderation effects.



**Figure 4.** Effort moderation effects.

The evaluation of the model is significant [ $F(3.454) = 373.2835, p < 0.001$ ]. In the same, it is obtained that the interaction effect caused by effort is significant (see Figure 5). As can be seen in the graph, when there is a low attitude towards organic products (negative attitude) and when a relatively high price is perceived, the intention to purchase organic products is significantly higher than when the attitude is low, and the price is perceived to be low. When attitude is high (positive attitude), purchase intention is high, independent of whether the perceived price is high or low. Therefore, the results support hypothesis 11.



**Figure 5.** Price moderation effects in purchase intention by attitude level.

The graphical representation of the second model is shown in Figure 6, which represents the moderating effect that effort is hypothesized to have on the relationship between attitude and purchase intention.

The evaluation of the model is significant [ $F(3.454) = 420.4136, p < 0.001$ ]. It shows that the interaction effect caused by effort is significant (see Figure 6). As shown in the graph, when attitude is low (negative) and when effort to access organic products is high, purchase intention is significantly higher than when attitude is low, and effort is low. purchase intention is significantly lower. When attitude is high (positive), purchase intention is high, independent of whether effort is high or low (slope of high attitude is not significant). Therefore, the results support hypothesis 12. Table 7 shows a summary of the results obtained.



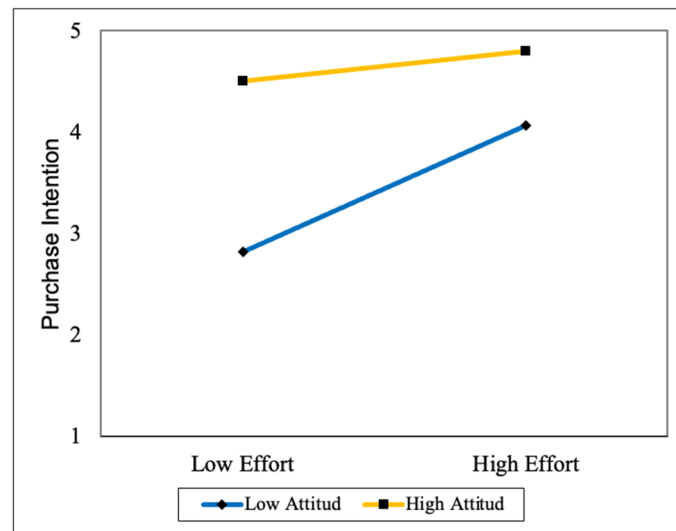


Figure 6. Effort moderation effects in purchase intention by attitude level.

Table 7. Summary of hypothesis results.

Hypothesis	Direct Relationships	Results
H1	Health has a positive impact on organic fruit purchase intention	Supported
H2	Health has a positive impact on attitude towards organic fruit	Supported
H3	Consumer fear towards conventional products has a positive impact on purchase intention for organic fruit	Not supported
H4	Consumer fear towards conventional products has a positive impact on attitude towards organic fruit	Not supported
H5	Environmental motivations have a positive impact on the intention to purchase organic fruit	Supported
H6	Environmental motivations have a positive impact on attitude towards organic fruit	Supported
H7	Positive attitude toward organic fruit has a positive impact on purchase intention	Supported
Hypothesis	Indirect Relationships	Results
H8	The relationship between consumer fear and purchase intention is mediated by attitude toward organic fruit	Not supported
H9	The relationship between health and purchase intention is mediated by attitude toward organic fruit	Supported
H10	The relationship between environmental motivations and purchase intention is mediated by attitude toward organic fruit	Supported
Hypothesis	Moderation Relationships	Results
H11	The attitude toward organic fruit effect on purchase intention is moderated by perceived price. Thus, the higher the perceived price, the greater the attitude effect on purchase intention	Supported
H12	The attitude effect toward organic fruit on purchase intention is moderated by effort. Thus, the greater the effort, the greater the attitude effect on purchase intention	Supported

#### 4. Discussion

The results reaffirm the recent findings of Rodriguez-Bermudez et al. [27] on the positive impact that health has on the attitude towards organic fruit by organic and conventional consumers, given better quality attributes and the absence of pesticide residues, but at the same time recognizing the barrier that price represents. Sadiq et al. [68] and Tigan et al. [69] also reinforce this recognition of a greater contribution to health, and Moor et al. [70] reinforce the price constraint.

Regarding the impact of health on the intention to purchase organic fruit, the results are in line with the meta-analysis of Rana and Paul [71] on the priority role of health in the decision making of an individual to purchase organic food. And the importance that this implies in the marketing strategies of traders and producers with respect to highlighting the health benefits of this food type. Among the strategies, the importance of the distribution channel stands out, given the effect of purchasing effort on the consumption of organic foods [72].

Environmental motivations have a positive impact on the attitude towards organic fruit, from the social perception about organic food consumers attributing to them higher morale, solidarity, generosity, social responsibility, and status than conventional food consumers [73]. Since the individual choice of organic consumption not only has an impact on health but also on the environment and sustainable development [74]. Thus, organic products are not only considered to be healthier, but also their production is essentially less harmful to the environment [68]. Therefore, consumers pay more and more attention to the products they buy, seeking to minimize the negative impact of their purchasing decisions on the environment [75]. Additionally, these environmental motivations also have a positive impact on organic purchase intention [18,76,77] effort to execute purchase attitude towards organic fruit purchase intention.

On the other hand, we found that the results rule out the effect of fear given the “negative” information about pesticides and chemical fertilizers contained in conventional fruits on the probability that a consumer enters the organic market [20,21,25,40,78]. Finally, this study presents a variant on the effects of high price on organic fruit purchase intention studied previously [18,27,79]. Identifying an increase in purchase intention at a higher price in consumers with a low attitude towards organic fruit. This directly proportional relationship has been previously observed, but only in consumers with a high attitude towards organic fruit, as a recognition of the higher quality of organic fruit [28].

#### 5. Conclusions

The aim in this study was to measure the organic fruit consumer behavior by identifying consumers’ attitude towards organic products and their purchase intention.

The results obtained show reliability and internal consistency in the model and determine that 66% of the total consumers had an attitude towards organic fruits, while 76.5% had an intention to purchase these products. In other words, the organic fruit consumption is becoming important for people, transforming into a sustainable consumption in women and men. In addition, the results showed that consumer fear of conventional products has no impact on the attitude and purchase intention of organic fruit consumers.

From these results it can be inferred that the attitude and purchase intention of consumers for organic fruits is closely related to health and environmental motivations, since they are identified as foods that provide the right and necessary nutrients to cover the caloric and nutritional requirements of the human body.

Therefore, this study demonstrates the consumers’ interest in organic fruits, highlighting that when the price is perceived as high, the consumers’ purchase intention is high even if their attitude towards organic fruits is low, and above all this study guides the generation of specific research lines among them, what happens with the health benefits provided by the organic fruit consumption. Further analysis should focus on the relationships that may exist between health and consumer satisfaction for organic fruit.

The limitations of this study, due to the sample composition, also open other future research lines, which will allow studying the effects of educational [27] and age level [5,80] on the attitude towards and the purchase intention of organic fruit.

**Supplementary Materials:** The following supporting information can be downloaded at: <https://www.mdpi.com/article/10.3390/horticulturae8100955/s1>, Table S1: OFCB2.xlsx.

**Author Contributions:** Conceptualization, A.V.-M. methodology, G.L.-H.; validation, A.V.-M.; formal analysis, G.L.-H., and A.V.-M.; writing—original draft preparation, G.S.-S., M.G.-M., N.C.-B. and G.L.-H.; writing—review and editing, A.V.-M. and G.S.-S.; supervision, A.V.-M.; project administration, G.S.-S.; funding acquisition, G.L.-H., G.S.-S., M.G.-M., N.C.-B. and A.V.-M. All authors have read and agreed to the published version of the manuscript.

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**Institutional Review Board Statement:** In line with the Helsinki Declaration of 1964 and its later amendments to the best of our knowledge, all the research procedures were performed within ethical standards. Ethical approval was not provided for this study on human participants because All data were anonymized, processed in aggregate form and under informed consent for the purposes of this research. The patients/participants provided their written informed consent to participate in this study. No potentially identifiable human images or data is presented in this study. No animal studies are presented in this manuscript. Additionally, formal approval was obtained from the competent authorities of the companies that participated in the study.

**Informed Consent Statement:** Informed consent was obtained from all subjects involved in the study.

**Data Availability Statement:** The analyzed dataset has been included as Supplementary Materials.

**Conflicts of Interest:** The authors declare no conflict of interest.

## Appendix A. Applied instrument

Reasons to purchase organic fruit:

- H1 Contains many vitamins and minerals.
- H2 Maintains health.
- H3 It is nutritious.
- H4 It has a high protein content.
- H5 Good for skin, teeth, hair, nails, etc.
- H6 It is high in fiber and dietary fiber.
- F1 Conventional food products available on the market contain pesticide residues.
- F2 Agricultural products from conventional agriculture cause disease.
- F3 Exclusive ordinary food consumption could lead to lifestyle-related diseases such as cancer, asthma, obesity, etc. in the long term.
- F4 Ordinary food consumption reduces longevity.
- F5 The environment suffers from conventional agricultural practices.
- F6 I avoid/reduce fruit consumption for fear about pesticide residues in food products.
- EM1 The current development way is destroying the environment.
- EM2 Environmental damage will be irreversible.
- EM3 I practice environmental saving activities.
- EM4 I prefer to consume recycled products.
- EM5 I throw my garbage in different containers.
- E1 I have time and am willing to travel extra distance for purchasing organic fruit.
- E2 I am willing to visit several different stores, especially to buy organic fruit.
- E3 Organic food is worth the extra effort it can take to buy it.
- E4 I switch grocery stores if my local supermarket does not carry organic food.
- PP1 Organic food is too expensive for me.
- PP2 Buying organic products is worth the effort.

- PP3 I prefer lower-cost substitutes.  
 BA1 Buying organic fruit is a very good idea.  
 BA2 Buying organic fruit is very important.  
 BA3 Buying organic fruit is very wise.  
 PI1 I intend to buy organic fruit in the future.  
 PI2 I hope to buy different kinds of organic fruit in the future.  
 PI3 I want to buy organic fruit in the future.

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