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The Factors Influencing Purchase and Willingness to Pay for Organic Vegetables

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Abstract | Organic vegetables are cultivated without chemical inputs to make them environmentally friendly, increasing the selling price. This study aims to analyze the influence of product attributes, psychography, and demography on the purchase of organic vegetables, product attributes, demography, and purchase to the willingness to pay (WTP) for organic vegetables. The research was conducted in East Java, Indonesia, in May 2021, based on an online survey through social media. Questionnaires were filled by 95 respondents who met the requirements. Data were analyzed using the partial least square–structural equation modeling (PLS-SEM) model. The results revealed that product, psychography, and demography influence the purchase of organic vegetables. Furthermore, product and demography also influence the WTP of organic vegetables. All product attributes positively correlate with product variables, except the label. About psychography, consumers' concern regarding the environment is more critical than health motivation, primarily in influencing the purchase of organic vegetables. The essential indicators of demography are education and income. Meanwhile, the purchase does not affect the WTP. This research contributes to marketing theory in determining the price of organic products. The practical contribution of strengthening the quality attributes of organic vegetable products by improving the packaging of organic vegetables with informative labels to increase consumer trust in organic vegetables.

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Introduction

East Java Province (Indonesia) has the most significant potential to produce environmental residues, owing to its population rate and environmentally unfriendly human behavior (Hariyanti *et al.*, 2021). Food crops contaminated with pesticides and metal pollutants can be toxic to the human body (Faisal *et al.*, 2019). Environmentally friendly agriculture conducts plant cultivation without chemicals to prevent environmental pollution.

Especially about food cultivation, environmentally friendly agriculture also aims to produce healthy and fresh food (Adawiyah *et al.*, 2021; Massaglia *et al.*, 2019). One group of plants that have been cultured organically are vegetables.

Future marketing should be in line with the principles of sustainable development and encourage consumers to be more concerned about the environment (Skowron and Szymoniuk, 2014). For example, one form of environmental concern is the willingness of

consumers to buy organic food products, although organic foods are more highly-priced than inorganic foods.

Organic vegetables are cultivated without chemical input to make them environmentally friendly; this raises their products' selling price (Alamsyah *et al.*, 2017; Rahayuningsih and Tain, 2021). The high cost of organic vegetables is an obstacle in expanding the market. Therefore, organic vegetables must-have product attributes that encourage consumers to buy them. Therefore, only consumers who have a high willingness to pay (WTP) form a segment of the organic vegetable market.

Product attributes are characteristics attached to the product (Chrysargyris *et al.*, 2017; Rahayuningsih and Tain, 2021). Willingness to pay is a concept from environmental economics, wherein consumers who have environmental awareness will be willing to pay more for products that are produced in an environmental-friendly manner, including organic vegetables (Bhattarai, 2019; Rani *et al.*, 2018; Skreli *et al.*, 2017).

Several previous studies on the attributes of fruits and vegetable products found that organic belief, freshness, taste, and seasonality affect vegetable selection (Massaglia *et al.*, 2019; Relawati *et al.*, 2017). In particular, the level of trust in organic food affects the purchase (Faletar *et al.*, 2018; Rahayuningsih and Tain, 2021; Slamet *et al.*, 2016).

Previous research has also studied consumer psychographics in influencing the purchase of organic products. Some of them are helpful indicators of environmental awareness and health motivation. The environmental concern has influenced consumers to purchase organic products (Bhattarai, 2019; Chrysargyris *et al.*, 2017). Consumers' concern for health also affects their demand for organic vegetables (Kini *et al.*, 2020; Srineng and Tapa, 2018). Demographic factors such as gender, education, income, and the number of family members also influence green consumers in purchasing organic food (Lee *et al.*, 2019; Slamet *et al.*, 2016; Srineng and Tapa, 2018; Zhang *et al.*, 2018).

Research on WTP found that environmental awareness is an essential factor influencing it (Sarma *et al.*, 2020; Slamet *et al.*, 2016). As a result, consumers

are willing to pay more (WTP price premium) for healthier foods such as antioxidant eggs and organic eggs (Anderson, 2009; Relawati *et al.*, 2021c), organic vegetables (Bhattarai, 2019; Chrysargyris *et al.*, 2017; Rahayuningsih and Tain, 2021), as well as organic rice (My *et al.*, 2017; Zhou *et al.*, 2017). However, environmental awareness does not necessarily lead to purchases (Slamet *et al.*, 2016).

Previous studies have failed to discover why environmental awareness does not always affect WTP. The novelty of this study lies in placing environmental awareness and health motivation as moderating factors for purchasing factors influencing WTP. The two indicators were collected to reflect the latent variable of consumers' psychographics. As stated earlier, this study aimed to analyze the influence of product attributes, psychography, and demography on the purchase of organic vegetables and the effect of product attributes, demography, and purchase on WTP of organic vegetables.

The Main Indicators of Purchase

Product attributes: Product attributes are characteristics inherent in the product (Moser *et al.*, 2011) consumers will highly consider this in purchasing products (Kotler and Keller, 2012; Skreli *et al.*, 2017). For example, organic vegetable products are products produced without chemicals, but consumers will still consider quality at the time of purchase as food products. These qualities can be observed from the visual appearance of organic vegetables, taste, quality, and credence attributes such as being healthy and environmentally friendly (Moser *et al.*, 2011).

Labels and packaging are also essential attributes in organic vegetables. Labels can provide information and assurance that the vegetable product is organic, does not contain chemicals in the production process (Skreli *et al.*, 2017). Packaging is also essential to facilitate sales because organic vegetable products are packaged in a specific gram volume. In addition, packaging can also give the impression of a neat look and make it easier for consumers to make purchases (Adawiyah *et al.*, 2021; Chekima *et al.*, 2019).

Psychography: Psychography is an important aspect that shapes consumer segmentation and influences purchasing decisions (Kotler and Keller, 2012). Many studies included environmental concerns as a psychographic factor that drives the decision to buy

organic vegetables (Faletar *et al.*, 2021; Iocola *et al.*, 2018; Srineng and Thapa, 2018). Environmental concern is a psychographic aspect that encourages consumers to consume organic vegetables because they do not want any chemical contamination in the environment (Bhattarai, 2019; Slamet *et al.*, 2016).

Motivation is one of the essential psychological processes in consumers (Kotler and Keller, 2012). In organic vegetable consumers, a critical motivation is health motivation because, in addition to vegetable nutrition being good for health, the guarantee of pesticide residues on organic vegetables will further strengthen aspects of consumer health. Therefore, most consumers choose organic vegetables is due to the encouragement of motivation (Adawiyah *et al.*, 2021; Skreli *et al.*, 2017).

Demography: Food buying behavior is closely related to the consumers' demographic (Skreli *et al.*, 2017). Demographics are a person's identity, including gender, age, education, and income (Kotler and Keller, 2012). In determining organic vegetable products, demographic indicators include gender, age, marital status, education, employment, income, and family size (Sarma *et al.*, 2020). The higher the demographic level, especially education and consumer income, the stronger preferences, and WTP toward purchasing and consuming organic vegetables (Skreli *et al.*, 2017; Slamet *et al.*, 2016).

Purchase: The purchase of organic vegetables is part of pro-environmental consumer behavior (Chrysargyris *et al.*, 2017; Faletar *et al.*, 2021). Purchases can be measured from indicators of frequency or intensity (Kini *et al.*, 2020). The location or place of purchase also influences the decision to buy vegetables or eat organic (Faletar *et al.*, 2021; Massaglia *et al.*, 2019).

Willingness to pay (WTP): WTP is the willingness of consumers to pay for a product. For organic products, in general, the willingness of consumers to pay more expensive (premium prices) on environmentally friendly products (Bhattarai, 2019; Skreli *et al.*, 2017). The premium price of organic food can be measured from units of money or more expensive money indicators (Skreli *et al.*, 2017) or a percentage more expensive (Bhattarai, 2019).

Relationship between research concepts: Consumers indeed consider the quality of the products

purchased. Many previous studies have suggested that product attributes influence the purchase of organic vegetable products (Massaglia *et al.*, 2019; Skreli *et al.*, 2017). Therefore, this study examined the causality relationship of product attributes to the purchase of organic vegetables.

Consumer psychography is one of the bases of market segmentation. One is that attitude can be intervening before consumers decide on purchase intentions (Kotler and Keller, 2012). Many previous studies have found that psychographic characteristics influence the purchase of products. Health and environmental concerns affect the purchase of organic food (Łuczka, 2019; Massey *et al.*, 2018; Srineng and Thapa, 2018). Therefore, this study examined the effect of consumer psychographics on the purchase of organic vegetables.

Consumer demographics are closely related to purchasing behavior (Kotler and Keller, 2012). Many previous studies have found that socio-demographic factors influence a purchase. Among them are gender, education, and consumer income that affect the purchase of organic food, including organic vegetables (Ditlevsen *et al.*, 2020; Handranata and Murbarani, 2019; Mcfadden and Huffman, 2017; Slamet *et al.*, 2016). Based on theories and previous studies, this study examined the influence of demographic variables on the purchase of organic vegetables.

Consumers' WTP in organic vegetables cannot be separated from the product attributes. Various previous studies have stated the influence of product attributes on the WTP of environmentally friendly products (Kini *et al.*, 2020; Massaglia *et al.*, 2019; Skreli *et al.*, 2017). Therefore, this study examined the effect of product attributes on the willingness to pay (WTP).

Consumer demographics are inherent characteristics of consumers, including gender, age, education, and income. The higher the demographic level of a person, especially income, the stronger the purchasing power of consumers. IF it is strengthened by consumer education will build awareness of environmentally friendly products such as organic vegetables. Previous research results stated a demographic link with WTP (Bhattarai, 2019; Chrysargyris *et al.*, 2017; Skreli *et al.*, 2017). Therefore, this study examined the effect of consumer demographics on the WTP of organic vegetables.

Consumers with high purchase intensity and choosing an excellent place to buy certainly are willing to pay for products. Some previous researches have found that purchase intentions correlate with willingness to pay (Mcfadden and Huffman, 2017; Zhang *et al.*, 2018). Furthermore, the purchase of organic vegetables is also influenced by choice of place to purchase (Chrysargyris *et al.*, 2017; Faletar *et al.*, 2018; Poyearleng *et al.*, 2019). Therefore, this study examined the effect of purchasing on organic vegetable WTP.

Materials and Methods

Research Location and Sampling Methods

This research was conducted in East Java, Indonesia, in May 2021, based on an online survey conducted through social media. The Google Form link information was shared through a WhatsApp Group with member domiciles in the East Java region. Respondents filled out this Google Form to answer several questions about the availability of organic vegetables in their area of residence, purchasing organic vegetables, and the WTP of organic vegetables. A total of 95 respondents filled out the questionnaire on Google Form as they fulfilled the requirements. According to Solimun *et al.* (2017), the sample number of 30 to 100 people is sufficient in the PLS-SEM analysis using WarpPLS software because it applies to resample and bootstrapping. The software used in this research was WarpPLS 6.0.

Variables and Analysis

Details of latent variable names, observed variables, and data measurement scales have been presented in Table 1. Product latent variable is measured from five indicators in the form of product attributes, namely the characteristics inherent to organic vegetable products. All product indicators were measured using a Likert Scale, so the choice of the structure of the latent variable in the PLS-SEM is reflective. Demographics were measured using four indicators with ratio, ordinal and nominal scales; thus, the choice of form of the latent variable was formative. Psychographic variables were measured using indicators of environmental awareness and health motivation, in the form of reflective variables. Purchase variables were measured from the place to buy and buying intensity indicators, the choice of the structure of the reflective variable. Finally, the WTP variable was measured from the Premium in Rupiah

(IDR) and premium in percentage price indicators. Both indicators were measured using a ratio scale; thus, the form of the latent variable was formative.

Table 1: *The latent and observed variables.*

Latent variable	Observed variable	Measurement scale	Variable form
Product	Quality	Likert scale	Reflective
	Flavor	Likert scale	
	Nutrition	Likert scale	
	Label	Likert scale	
	Packaging	Likert scale	
Demography	Age	Ratio scale	Formative
	Education	Ordinal	
	Gender	Nominal	
	Income (per month)	Ratio	
Psychographic	Environmental concerns	Likert scale	Reflective
	Health motivation	Likert scale	
Purchase	Place to buy	Nominal	Reflective
	Intensity	Ratio scale	
WTP	Premium in percent-age	Ratio	Formative
	Premium in Rupiah	Ratio	

Data were analyzed using the partial least square-structural equation modeling (PLS-SEM) model. The PLS-SEM was used to analyze the influence of product attributes, psychography, and demography on the purchase of organic vegetables and the effect of product attributes, demography, and purchase on WTP of organic vegetables. The empirical models are mentioned in equation (1) and (2).

$$Y_1 = \beta_{01} + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \epsilon_1 \dots \dots \dots (1)$$

$$Y_2 = \beta_{02} + \beta_4 X_1 + \beta_5 X_3 + \beta_6 Y_1 + \epsilon_2 \dots \dots \dots (2)$$

Where;

Y_1 : Purchase of organic vegetables; Y_2 : Willingness to pay for organic vegetables; X_1 : Product attributes; X_2 : Psychography of consumers; X_3 : Demography of consumers; $\beta_{01} - \beta_6$: Path coefficient; $\epsilon_1 - \epsilon_2$: Error of estimation.

Results and Discussion

The results of the study present the characteristics of the respondents, the attributes of organic vegetable products, the WTP of organic vegetables, and the factors that influence the WTP of organic vegetables. In addition, each result has been discussed with

verification of previous research.

Characteristics of Respondents

Table 2 presents the characteristics of the respondents, including age, education, gender, and family income. Each character is shown in the number and percentage of the total respondents. The age interval of most respondents (47.3 %) in the range of 41 yr to 50 yr formed the productive age range. The highest education for most respondents was high school, at 41.1 %. This level of education shows that the respondents' families had undergone secondary education, although 24.2 % of respondents had only finished elementary school.

Table 2: *The respondent characteristics.*

Characteristics	Respondent number	Percentage
Respondents' age (years old):		
≤ 30	10	10.5
31 to 40	16	16.8
41 to 50	45	47.3
>50	24	25.2
Education:		
Elementary school	23	24.2
Junior high school	11	11.6
Senior high school	39	41.1
Undergraduate	22	23.2
Gender:		
Female	60	63.2
Male	35	36.8
Family's income:		
< 2 000 000	24	25.2
2 000 000 to 4 000 000	49	51.5
4 001 000 to 6 000 000	12	12.6
6 001 000 to 8 000 000	2	2.1
> 8 000 000	8	8.4

The gender distribution of respondents was predominantly female (63.2 %). The greater likelihood of women being respondents could be that families commonly hand over food shopping and consumption to women. This is common across several previous studies, in which respondents who were willing to answer questions about food consumption were predominantly female (Relawati *et al.*, 2021b).

The income distribution of the respondents' families ranged from less than IDR 2 000 000 to more than IDR 8 000 000. The income interval most of the

respondents (51.5 %) fell in was the monthly income of IDR 2 001 000 to IDR 4 000 000. This income range is almost the same as several previous studies in Indonesia, that is, family income of less than IDR 3 000 000 mo⁻¹ (per month) (Slamet *et al.*, 2016), IDR 5 000 000 to IDR 6 000 000 mo⁻¹ (Adawiyah *et al.*, 2021), less than IDR 5 000 000 mo⁻¹ (Relawati *et al.*, 2021). This income level is sufficient to meet consumption needs, among which is the purchase of organic vegetables (Slamet *et al.*, 2016). A small number of respondents had a reasonably high income of more than IDR 10 000 000 mo⁻¹.

The product attributes of organic vegetables

The attributes of organic vegetable products studied include quality, flavor, nutrition, label, and packaging. Table 3 presents details of the attributes of organic vegetable products based on respondents' assessments. Each product attribute has detailed the distribution of respondents' answers based on a Likert scale ranging from 1 to 5 and the average score.

Table 3: *The product attributes of organic vegetables.*

Product attributes	Respondents at each score					Average score
	1	2	3	4	5	
Quality	-	2	-	71	22	4.19
Flavor	-	-	-	79	16	4.17
Nutrition	-	-	-	61	34	4.36
Label	2	20	-	60	13	3.65
Packaging	-	16	-	67	12	3.79

Table 4: *The willingness to pay for organic vegetables.*

Description	Respondent number	Percentage
Fixed price (not increased)	57	60.0
10 % more expensive	32	33.7
20 % more expensive	4	4.2
30 % more expensive	2	2.1

The willingness to pay

Willingness to pay is measured by the willingness of consumers to pay for organic vegetables at a price higher than the current price (during the study). Table 4 shows that the highest number of consumers (60 %) were willing to pay fixed costs at the current price, that is, at the time of the study. The rest of the consumers were willing to pay more in the range of 10 % to 33.7 %. This signifies that organic vegetables can be marketed at a higher price than the current price, even if only aimed at a limited consumer segment.

Table 5: *The loading and cross loading.*

Indicator	Product	Demography	Purchase	WTP	Psychography
Quality	0.911	0.172	0.029	0.085	0.074
Flavor	0.924	-0.022	0.084	-0.115	-0.151
Nutrition	0.978	-0.107	-0.215	0.070	0.100
Label	-0.470	0.541	0.476	0.378	0.230
Packaging	0.745	-0.027	0.970	-0.144	-0.099
D-Age	0.328	-0.890	-0.305	-0.256	0.344
D-Education	0.275	0.939	-0.131	-0.175	0.081
D-Gender	0.018	0.902	0.231	-0.265	-0.127
D-Income	-0.079	0.935	-0.235	0.279	0.177
Purchase-Place	-0.472	-0.081	0.943	0.056	-0.262
Purchase-Intensity	0.790	0.135	0.730	-0.094	0.439
WTP-%	0.028	-0.396	0.286	0.964	-0.147
WTP-IDR	-0.031	0.436	-0.315	0.916	0.161
Psy-Environment	-0.166	0.339	-0.193	0.009	0.973
Psy-Health	0.220	-0.450	0.256	-0.012	0.875

Note: *The bold number indicates the loading value for each indicator is more than 0.3 and is greater than the cross loading value.*

The average WTP willing to pay is 4.84 % more expensive than the current price. The current average price is IDR 11 944 per 400 g. This means that the WTP price is IDR 11 944. This price applies to the size of organic vegetables on average per bunch of vegetables with an average weight of 400 g. If it is converted to the unit price of kg, the current price would be IDR 25 737 while the WTP price would be IDR 29 860. This additional 4.84 % price seems low because it constitutes the difference between the actual price and the WTP price of organic vegetables. The price difference of 31 % to 67 % is more expensive than various organic and inorganic vegetables (Sarma *et al.*, 2020).

Factors affecting willingness to pay

Table 5 presents the loading and cross-loading of the organic vegetable indicators included in the PLS-SEM model used to test the validity of the research instrument. If the loading value is greater than 0.3, then it meets convergent validity (numbers in bold), while discriminant validity is indicated by a loading value greater than cross-loading (Solimun *et al.*, 2017). Table 5 shows that all latent variable indicators have a loading value greater than 0.3 so that they meet convergent validity. Furthermore, each loading in the column of the latent variables is greater than the cross-loading at the side column, so all indicators meet the discriminant validity. Based on both validities, all indicators are valid to analyze.

The suitability of the PLS-SEM (goodness of fit) model is indicated by the significance of four indicators. Average path coefficient, (APC) = 0.229, with P-value = 0.005, means significant at the error rate of 0.5 %. Average R-squared (ARS) = 0.247, P = 0.003, means that the independent latent variable can explain the latent dependent variable of 24.7 % and is significant at the error level of 0.3 %. Average block value, VIF (AVIF) = 1.146, acceptable if ≤ 5 , ideally ≤ 3.3 , means no multicollinearity between latent variables used in the model.

Figure 1 shows the results of the PLS-SEM test to explain the path coefficient and p-value from the independent latent variable to the latent dependent variable. The path coefficient value indicates the magnitude of the influence of the independent latent variable, while the p-value indicates the significance level of the effect. The following is an explanation of each relationship between the latent variables.

Product attributes significantly affect the purchase of organic vegetables (purchase) with a path coefficient of 0.25 and significant at $\alpha < 1\%$. The product also affects WTP with a path coefficient of 0.15 and an α of 6 %. Psychography significantly affects purchase with a path coefficient of 0.20 and a significant α of 2 %. Demography has a significant effect on the purchase of organic vegetables, with a path coefficient of 0.17 with an α of 4 %. Demography also affects WTP with a path coefficient

of 0.48 and an alpha of $< 1\%$. While the purchase has no significant effect on WTP since the alpha is 12% , it is greater than the significance level of 10% ($\alpha = 0.10$).

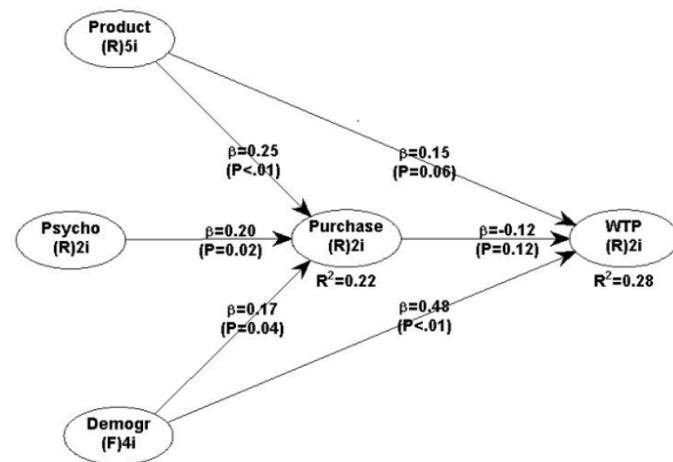


Figure 1: The PLS-SEM result.

Table 6: The path coefficients and p-values.

Latent Var.	Path & p-value	Product
WTP	Path coefficient	0.151
	p-value	0.064
Purchase	Path coefficient	0.253
	p-value	0.005

The results of the PLS-SEM analysis have been presented in Table 6. Based on the path coefficient and alpha value, the demography is the most influential factor on organic vegetables' WTP. It has a positive effect on the value of WTP. The greater the consumer's demography, the greater was the value of WTP. Besides, demography also influences purchasing with a lower path coefficient and higher alpha ($\beta = 0.17$; $\alpha = 0.04$). This means that the greater demography, the higher the purchase intensity of organic vegetables.

The second order of influential factors was the positive effect of the product on the purchase, with a path coefficient of 0.25 and alpha < 0.01 . It means that the greater product quality attributes, the higher the purchase intensity.

The third order of influential factor is psychography. It has a significant favorable influence on the WTP of organic vegetables with a path coefficient of 0.20 and an alpha of 0.02. This means that the higher the psychographic score, the higher the WTP. The explanation is that environmental concerns and

health motivations influence consumers' WTP for organic vegetables.

Purchasing does not have a significant direct effect on the WTP of organic vegetables. A low path coefficient value indicates this (-0.12) and a high alpha value of 12% . This implies that the intensity of purchasing organic vegetables does not mean that they show a high WTP.

Table 7: The loading factors and average scores of each indicator.

Latent Variable & Indicators	Loading	Average	Std. Deviation
Product			
Quality	0.911	4.19	0.53
Flavor	0.924	4.17	0.38
Nutrition	0.978	4.36	0.48
Label	-0.470	3.65	1.03
Packaging	0.745	3.79	0.87
Demography			
Age	-0.890	44.75	8.46
Education	0.939	2.63	1.09
Gender	0.902	Female= 60 Male= 35	
Income (IDR mo ⁻¹)	0.935	4 083 157	-
Psychography			
Envi. Concerns	0.970	4.37	0.48
Health motivation	0.713	4.36	0.69
WTP			
Premium in %	0.964	4.84	6.68
Premium in IDR	0.916	11 944	12.23
Purchase			
Place to buy	0.973	Market/grocery = 30 - Organic stall = 19 Online market = 46	
Buying intensity	0.875	3.06	1.14

Table 7 presents the loading factors and average scores of each indicator. The loading value shows the strength of the indicator's correlation with the latent variable. So, the greater value of the loading factor, the greater the influence of the independent variable. The average score shows the average score of the indicators in the primary data. The average score is partly derived from the Likert scale measurement with a range of 1 (strongly disagree) to 5 (strongly agree). Therefore, the greater the average score, the better the value of the indicator of field data. In addition, some indicators are measured by a ratio scale, namely consumer

income-IDR, WTP-IDR, and WTP percentage.

Based on the loading value and the average indicator score, recommendations can be formulated to improve or increase the purchase of organic vegetables. The recommendation priority scale is based on the latent variable with the most significant path coefficient. It considers the average score of the field data indicators, which is still not good. Furthermore, priority is based on the highest loading value for each latent variable.

Table 7 shows that low indicator scores on product variables are labels and packaging, with scores of 3.65 and 3.79, respectively. This means that the average score is still below the excellent and informative category (score 4). The loading indicator value of packaging is more potent, namely 0.745 compared to loading labels of -0.470.

The demographic variable positively influences the purchase and WTP of organic vegetables. Almost all loadings are positive and more than 0.9, except age with negative loading. A higher level of demography (education and income) leads to higher purchase intensity and WTP of organic vegetables. Only age is negatively correlated with demographic variables. The older the age, the lower the purchase intensity and WTP; this could be possible because of the lower-paying power of consumers. The average age is 44.75 yr (Table 7); it means that there are still respondents above that age (Table 2). Therefore, it is necessary to raise awareness of the elderly group about the importance of organic vegetables for health.

Psychography has a positive influence on the purchase of organic vegetables. The loading of environmental concern (0.970) is higher than this of health motivation (0.713). The loadings are slightly different (4.37 and 4.36). Therefore, to improve the purchase of organic vegetables, improving the environmental concern is a more recommended approach.

Demography is significantly influenced the WTP of organic vegetables. These results are in line with a previous study which indicated that household income, respondent's age, education, and gender correlated with their perception of organic agriculture, and primarily, income influences the preference and purchase of organic vegetables (Skreli *et al.*, 2017; Srineng and Thapa, 2018).

Demographic indicators include age, education, gender, and income. All demographic indicators have positive loading values, except age. This means that the higher the education and income of consumers, the higher the WTP of organic vegetables. In term of gender, women are more willing to pay for organic vegetables. Only age indicator has negative loading values, meaning that the older consumers the smaller WTP of organic vegetable. The smaller WTP in older consumers is due to their lower purchasing power.

The product attributes influence the purchase of organic vegetables. These results are in line with previous research that showed that trust in healthy organic vegetables affects purchases (Slamet *et al.*, 2016). Furthermore, product attributes such as quality, taste, and health affect the purchase of organic vegetables. In line with these results, the attributes of organic tomatoes have also influenced preferences and WTP (Skreli *et al.*, 2017). Besides, product attributes also influence the WTP with the lower path coefficient and higher alpha ($\beta = 0.15$; $\alpha = 0.06$). It means that the higher product's quality the higher WTP. These results are in line with Massaglia *et al.* (2019) and Skreli *et al.* (2017), who mentions the importance of the product attributes of organic vegetables.

Product attributes include five indicators namely quality, flavor, nutrition, label, and packaging. All product attributes have positive loading values, except label (Table 5). This means that the better the quality, flavor, nutrition, and packaging, the higher the purchase of organic vegetables. The label has a negative loading value even though the correlation is weak (< 0.5). This is because the label score is still low, namely 3.65 (Table 7). The labels have not been able to provide information about organic vegetables to create consumer's trust.

The psychographic factor that includes environmental concerns and health motivations influence consumers' WTP for organic vegetables. One of the results of previous studies that are in line with these results is (Srineng and Thapa, 2018), who stated that consumer perceptions of the environment and health benefits affect the consumption of organic vegetables. Furthermore, in line with psychographic factors, attitudes towards the environment and a healthy lifestyle also affect the purchase of organic vegetables (Faletar *et al.*, 2021; Rahayuningsih and Tain, 2021).

Consumers who have high environmental concerns and health motivations will also have a willingness to pay higher price on organic vegetable. Consumers on this category are a potential market segment in the marketing of organic vegetables. Therefore, an important information about 'organic' should maintain the trust of this market segment.

Purchasing does not have a significant direct effect on the WTP of organic vegetables. This result is in line with [Faletar et al. \(2021\)](#), that purchasing organic vegetables is a pro-environment practice. However, the lower-income can be a barrier to a higher WTP. Further explanation of these variables has been detailed based on the loading factor and the average score of each indicator.

The data show that the product's label and packaging are assessed at a lower score. Most of the organic vegetables are marketed only by being tied with insulation labeled organic vegetables or placed on organic vegetable shelves, but the vegetables are not packaged. A small number of organic vegetable outlets have packaged organic vegetables so that they look more elegant and the labels more informative. An important effort to increase the purchase and WTP of organic vegetables could be improving packaging. This packaging improvement can be combined with organic vegetable labels. Organic vegetable packaging can be made of wrapping paper wrapped at the base of the vegetable to the end in an open position. Another way of packaging could be using transparent cassava bags to avoid the use of plastic packaging. Eco-friendly packaging is used to attract consumer preferences ([Trimo et al., 2021](#)), as consumers of organic vegetables are more concerned about the environment.

The importance of packaging with organic labels to market organic vegetables in East Java (Indonesia) is different from that in Finland and other European countries. For example, organic vegetable marketing in Finland does not use distribution through supermarkets but instead employs direct distribution channels. Therefore, organic products are not labeled but sold directly by the producers (farmers) who possess appropriate certificates; however, the area in which they share similarities is a belief in products that are ecological, tasty, and healthy ([Szymoniuk and Valtari, 2018](#)).

Conclusions and Recommendations

The demography of consumers, product attributes, and consumers' psychography have a highly positive effect on the purchase and WTP of organic vegetables. The essential indicators of demography are education and income. All product attributes positively correlate with the product variable, except the label. The label of organic vegetables is still perceived as less informative by consumers. About psychography, consumers' concern for the environment is more important than health motivation, mainly in influencing the purchase of organic vegetables. Meanwhile, purchase does not have any significant effect on the WTP of organic vegetables.

Therefore, it is recommended that the quality attributes of organic vegetable products be strengthened, namely by improving the packaging of organic vegetables and equipping them with informative labels to increase consumer trust in organic vegetables. It is also important to educate the elderly consumer group about the health benefits of consuming organic vegetables, to increase their WTP for organic vegetables.

Limitation and Future Improvement

The limitations and future improvement of this study can be summarized in three points. First, this study considers organic vegetables and places of purchase in general rather than specific types of vegetables and places of purchase, so the findings may differ for different types of vegetables and places of purchase. Future research should test the proposed model for certain types of vegetables, such as broccoli, mustard greens, kale, spinach; and certain points of purchase such as modern supermarkets, organic specialty outlets and vegetable stalls. Second, a direct survey approach with observations of consumers who buy organic vegetables is recommended for further research to ascertain purchasing behavior and willingness to pay. Direct observations will be very useful in observing consumer behavior in buying organic vegetables and can also help us to understand how buying behavior and willingness to pay are affected. Finally, future research may include a sample of the population based on consumer income segmentation for more precise findings .

Novelty Statement

The novelty of this study was indicating that the product attributes of organic vegetables influence

their purchase and WTP. The lower scores of attributes were measured on indicators of packaging and labeling. Therefore, it is important to improve the packaging of organic vegetables; they should be equipped with informative labels to increase consumer trust. Moreover, psychography and demography also influence the purchase and WTP of organic vegetables. It is important to educate the elderly consumer group about the importance of consuming organic vegetables for their health to improve purchase and WTP.

Author's Contribution

BYA: Designed the study, elaborated the data analysis, performed literature search, prepared manuscript and revised manuscript.

RR: Elaborated the intellectual content, performed literature search, data tabulation and analysis, reviewed manuscript and revised manuscript.

BS: Performed literature search, reviewed manuscript and revised manuscript.

WAK: Reviewed and revised the manuscript.

All authors read and approved the final manuscript.

Conflict of interest

The authors declare that there is no conflict of interest regarding the publication of this article.

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