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A NEW SCALE PROPOSAL FOR GREEN PERCEIVED VALUE

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1 Introduction

Food production and consumption have major negative impacts on environmental sustainability (Azzurra, Massimiliano & Angela, 2019). For example, worldwide, agriculture has been linked to substantial proportions of greenhouse gas emissions, food wastage, land degradation, and water usage (Alam, Bell, & Biswas, 2019; Duong, 2020). Findings solutions to protect the environment has been a critical topic in many parts of the world, and a relevance research theme (Yogananda & Nair, 2019).

Chemical's usage in agriculture (heavy metals, pesticide residues, persistent organic pollutants, and other chemical compounds) are identified in many crops (Gizaw, 2019). Research reports chemicals concentration exceeding tolerable limits for consumable food items (Rather, Koh, Paek, &Lim, 2017). As a result, food contamination by harmful chemicals is one of the major public health concerns related with the food market (Ha, Shakur, & Do, 2019), making food safety as one of the main focus areas of food trade and health.

The incidence of disease related to food safety, such as diabetes and heart disease, triggered an alarm that made consumers realize the importance of food quality and safety (Soroka & Wojciechowska-Solis, 2019). Moreover, even not being this main research focus, recent studies are linking food safety and food security regarding to the Covid-19 pandemic (Silva Filho & Gomes Junior, 2020).

Known as the inverse of food risk, food safety means the probability of not suffering any danger when consuming a specific food (Henson & Traill, 1993). Many food consumers seem to be concerned about food safety on the food system, as evidenced by the growing demand for environmentally friendly food products that are chemical-free or produced under organic practices (Troudi & Bouyoucef, 2020). These ecologically conscious consumers or green consumers are more likely to exhibit ecologically correct behaviors than others (Menozzi, Sogari, Veneziani, Simoni, & Mora, 2017). Some researchers interchangeable use "green" term with others including "ecologically correct" or "environmentally responsible", therefore all of these terms describe activities that are good for the environment (Aschemann-Witzel & Aagaard, 2014). Consumers demanding for green food products have become one of the crucial market segments, and the shift to organic inputs usage can be seen as a support for agriculture, which reduces environmental damage.

Along with sustainable agriculture, food systems must provide sufficient and nutritious food for everyone, while minimizing environmental impacts, allowing producers to have a sustainable and profitable operation (Willett et al., 2019). Food security exists when everyone, at all times, has physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for a healthy life (WHO, 2001).

The growth of ecologically correct behavior pushes the increasing demand for green products, this resulted in academic interest in green food products (Chen & Chang, 2012; Suki, 2016). In this green marketing context, Sangroya and Nayak (2017) proposed a scale to evaluate Green Perceived Value (GPV) adopting four sub-constructs named functional value, conditional value, social value and emotional value.

Previous studies have identified the food safety and food security values guiding attitudes towards green food products purchase (Armanda, Guinée, & Tukker, 2019; Liu, McCarthy, & Chen, 2016). Based on these findings, and following Sangroya and Nayak, (2017) suggestions of future studies, we intend to validate a new proposal of a (GPV) Scale. A new scale involving the food safety and food security contemplates a better knowledge on how consumers perceive green food products. The GPV is proposed as a multidimensional second order formative construct with six first order dimensions: social value, functional value,

emotional value, conditional value, food safety value and food security value. The new scale is a helpful tool to policy makers, and market managers formulating strategies to influence green food consumers. We used a Structural Equation Modeling (SEM) to validate the GPV Scale. This study is the first part of a doctoral thesis, which the main purpose is to analyze the relationship among the food safety and food security values to green perceived value construct, toward the attitudes and intention on purchasing green food products. Therefore this results will be limited to discuss the scale validation assuring a valid measure for green food product purchase intention.

2 Theoretical framework

Chen and Chang (2012) defined GPV as "a general consumer assessment of the net benefits of a product or service between what is received and what is given based on the consumer's environmental desires, sustainable expectations and green needs" From the aspect of environmental and green consumption, values for green products or services is based on the environmental friendliness attributes which are significant to customers (Hartmann & Ibanez, 2006). Green food products are characterized as a subset of quality, profits, and ecological values affecting the green clients' dependence on green items (Hartmann & Ibanez, 2006).

2.1 Understanding GPV scale

Sangroya and Nayak (2017) proposed a scale to evaluate GPV based on four sub-constructs named functional value, conditional value, social value and emotional value. Functional values are related to consumers' decision-making including attitudes, perception and behavior, involved in weighing various costs and benefits of practical utilities that consumers can obtain in the process of consumption (Han, Wang, Zho, & Li, 2017). Conditional Values are explained as the "perceived utility acquired by an alternative as the result of the specific situation or set of circumstances facing the choice maker" (Sheth, Newman, & Gross, 1991, p. 162). Discount, promotion, and incentives are extrinsic circumstances, which could be predicted or unpredicted, creating alternative choices, characterizes the conditional value (Sheth et al., 1991). Social values are associated with the perception about what the society would think or how it would respond when an individual buys some product (Sangroya & Nayak, 2017). Consumers' behavior is formed from references composed by the social groups to which each individual belongs. The emotional values are related to feelings and emotions that a buyer experiences while purchasing a product (Wiedmann, Hennigs, & Siebels, 2007). Nowadays emotions are considered a key factor in every stage of buying process.

Based on literature, a relationship was found among food safety and food security leading to attitudes toward purchasing green food products (Mohammad, Chowdhury, Biswas, & Absar, 2018). Thus, it is proposed to test the relationship among food safety and food security to GPV to understand whether these constructs contribute to a better scale explanation.

2.2 The new associated value dimensions (food safety and food security)

Consumers concern about food quality and safety have grown (Yogananda & Nair, 2019), and yet, green foods products characterized as having fewer chemical residues have become more popular worldwide (Bearth, Cousin, & Siegrist, 2014). Studies indicate consumers belief that safe foods, such as organic and green foods, are related to healthy living life associating as a lower pesticide, and mortality related risk (Yu, Gao, & Zeng, 2014). The rising concern for the future generations, and the increase of health-consciousness, has also contributed to the growing popularity of the green movement. Thereafter, the green consumer

behavior has altered the importance consumers attribute to decisive factors leading to the intention to buy green products (Yogananda & Nair, 2019).

2.2.1 The food safety dimension of the GPV

Food safety in the food market is one of the key areas in public health, as it shakes people of every gender, age, race, and income level around the world (Gizaw, 2019). Food safety issues have made consumers become more concerned and supportive with local farmers to ensure their food safety (Hatton, 2015). Zhang et al. (2018) affirm that safe food is healthy, nutritious and environmentally friendly by green, sustainable and clean production.

Consumers are concerned about several food hazards, particularly chemical hazards which were perceived to be invisible, having long term effects and serious health consequences (Ha et al., 2019). Besides the chemical hazards, contamination can also occur associated with environmental issues, such as water and air pollution or soil contamination. Clinical symptoms represent a wide spectrum of diseases, from acute sickness to long-term illnesses, which include gastrointestinal infections, immune disorders, neurological complications, multiple organ failure and even cancer (Mohammad et al., 2018). Based on this explanation we hypothesize:

H1*: Food safety are* positively *related to the GPV*

2.2.2 The food security dimension of the GPV

The food systems and the sustainable agriculture need to afford sufficient and nutritious food for all, while minimizing environmental impingement and allowing producers to make a decent living (Willett et al., 2019). Effective planning and management of limited environment resources to meet current and future socioeconomic demands for sustainable development is challenging.

Most understand an urgent need on the agriculture and food systems to first, quit environmental damages, and make progress on several sustainable development goals at planetary boundaries. However, there are intense debates on how to achieve this sustainable development, with two dominating narratives discussion: improve efficiency in conventional agriculture through incremental steps while reducing negative externalities versus a transformational rethinking of farming systems based on agro ecological principles (Eyhorn et al., 2019). According the food security principles, we hypothesize that:

H2*: Food security are positively related to GPV*

2.3 GPV as formative second order construct

Based on previous work involving emotional value, functional value, conditional value and social value, we propose to include the food safety and food security constructs in order to obtain a more accurate GPV scale. Thus, we proposed the GPV scale measured by six first order constructs. This study follows four criteria established by Jarvis, MacKenzie, and Podsakoff (2003) to determine whether a construct is formative or reflective: (1) the causality direction flows from the construct to the formative value to be measured; (2) the measurement variables must not be interchangeable; (3) the covariation among indicators should not be present; and (4) the measures do not necessarily capture the same aspects of the construct domain, therefore, they are not necessarily interchangeable.

The establishment of the GPV as a second order formative construct can be verified according to the following reasons: The theoretical definitions of GPV causality are expected to move from the dimensions to the GPV construct. Any variation on the values dimension would affect the GPV, but not necessarily a variation in the GPV would affect its dimensions.

Therefore, each of the GPV's measurement dimensions has a distinct form of contribution for the GPV construct (Lin, Sher, & Shih, 2005). The withdrawal of any formative dimension would affect the GPV theoretical explanation. Consequently, the dimensions cannot be interchanged. Thirdly, we assumed no covariation among the GPV formative constructs, since each measurement has its respective value. For example, a green food consumer may rank low on conditional value but high on the food safety one due to their health concern. Lastly, the measurements not necessarily capture the same aspects of the construct domain. For example, in a study by Persaud and Schillo (2017), various dimensions of social factors positive shaped consumers' purchase. Nevertheless, they did not find the social influence positively influencing perceived value. These potentially divergent formative dimensions of the GPV construct demonstrate the formative character composing the GPV scale.

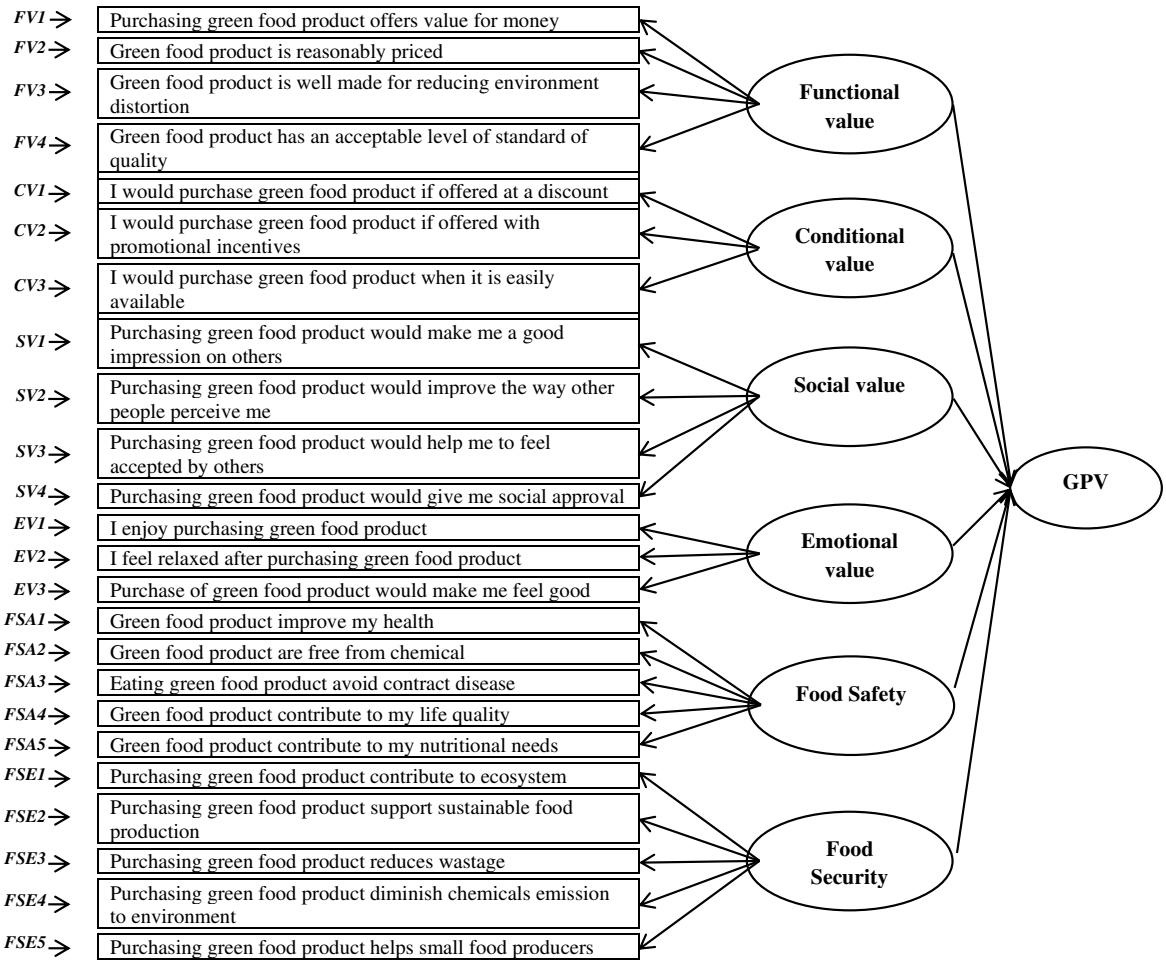

Figure 1. Structural model.

3 Methodology

This research started from the analysis of previous results of a qualitative study developed in a partnership among UFLA and Purdue University. It was identified food safety and food security values guiding fresh fruit consumers at farmers markets. It was also possible to identify elements associated with the sub-constructs of the GPV scale (functional value, conditional value, social value and emotional value), proposed by (Woo & Kim, 2019), for green food products purchase intention. The findings along with the literature review (Hatton, 2015; Wong & Tzeng, 2019), supported the development of statements to measure food safety

and food security. The formations of these two constructs are studied aligned with the four sub-constructs of the GPV to test whether the model of Woo and Kim (2019) can be improved.

These first order dimensions are examined as reflective constructs. It was used for the measurement structure the two-step approach (Sanchez, 2013). First, we extracted the scores for the latent variables through factor analysis. Then, to analyze the constructs relationships we used a SEM (Sarstedt et al., 2019). In this study, it was carried a descriptive (quantitative) analysis to develop a more comprehensive scale. We used the processes and methods recommended by Churchill (1979), in detail described on the following sections.

3.1 Generation of measurement items

From interviews with 30 farmers markets fresh fruits consumers, using in-depth interview, researchers have found a relationship among the food safety and food security values to the values forming the GPV scale. The interviews were carried out in the State of Indiana, U.S. from April to October 2020. A literature review was developed to better understand the values meaning and its possible association for the GPV scale formation. Based on the sentences provided by the interviewees as well as several studies such as (Eyhorn et al., 2019; Mohammad et al., 2018; Sangroya & Nayak, 2017; Woo & Kim, 2019) a preliminary list of measurements was created. These items were screened by a board of three marketing expert professors, two agri-business experts and one professor from horticulture and economic area. Researchers followed Woo and Kim (2019) assertives for the four measured GPV values (functional value, conditional value, social value and emotional value). Thus, it was adapted fourteen items. For the food security and food safety values it was proposed five items to each value totalizing twenty-four items measuring the GPV scale. All the measurements items were coded for software inputs and can be seen in Figure 1.

3.2 Questionnaire translation

The questionnaire needed to be adapted to Portuguese, since our sample are Brazilian's farmers market consumers living in the state of Minas Gerais. Researchers used the Collaborative and Iterative Translation technique proposed by Douglas and Craig (2007). The collaborative approach ensures that different points of view are represented for a better questionnaire development. Firstly, a translation was independently done by an administration doctorate student, a marketing expert, and a food safety and food security researcher. That procedure ensured a more accurate translation. Next, the team got together on a group online meeting to discuss and propose the most appropriate assertive.

To perform the questionnaire pre-test, researchers interviewed nine green food products buyers to validate and understand whether the items were properly measuring the respective constructs. It was conducted a cognitive interview, based on the Think Aloud technique to purify and examine the psychometric properties and the scale stability (Shafer & Lohse, 2005). Consumers had the opportunity to verbalize their thoughts and how they interpreted each item. No major changes were applied to the twenty-four items.

3.3 Scale purification

At this stage, the researcher aimed to observe the scale variables initial factor structure for a better refinement. Researchers submitted the questionnaire to 109 farmers market consumers at the time of purchase in the state of Minas Gerais, Brazil. The consumers were entirely explained about the research purpose. As they were at the moment of purchase, it was possible to contextualize the GPV dimensions related to green food products. After eliminating

respondents for a variety of reasons (i.e. failure to pass attention checks, and incomplete responses), 99 valid questionnaires have remained. Respondents were asked to evaluate each questionnaire statement in relation to their degree of agreement. A five-point Likert-scale was used for the measurement items, with points ranging from 1 (strongly disagree) to 5 (strongly agree), having 3 indicating neutral. A factor analysis was carried out to verify the necessity to exclude some items not contributing for the construct indexes. For the reflective characteristics of the first order constructs researchers verified the items outer loadings. According to Hair et. al. (2009), items loadings less than 0.50 should be eliminated from its constructs measurements. It was verified the construct reliability and validity, wherein constructs should have scores over 0.70 (Tenenhaus et. al., 2004). To assess discriminant validity, the Fornell and Larcker (1981) criterion was used. Each construct's AVE should be compared to the squared inter-construct correlation (as a measure of shared variance) of that same construct and all other reflectively measured constructs in the structural model. The shared variance for all model constructs should not be larger than their AVEs (Hair, Risher, Sarstedt, & Ringle, 2019). Table 1 presents the scores. We run a factor analysis through a Smart Pls 3 software.

Table 1

Scale purification for outer loadings, Composite Reliability, AVE, Discriminant Validity

	Items	Outer Loadings	Composite Reliability	AVE	Discriminant Validity
			0.906	0.709	yes
Functional Value	FV1	0.781			
	FV2	0.754			
	FV3	0.911			
	FV4	0.909			
			0.937	0.832	yes
Conditional Value	CV1	0.940			
	CV2	0.921			
	CV3	0.874			
			0.954	0.838	yes
Social Value	SV1	0.908			
	SV2	0.934			
	SV3	0.931			
	SV4	0.888			
			0.905	0.761	yes
Emotional Value	EV1	0.805			
	EV2	0.918			
	EV3	0.889			
			0.94	0,75*9	yes
Food Safety Value	FSA1	0.900			
	FSA2	0.812			
	FSA3	0.837			
	FSA4	0.927			
	FSA5	0.876			
			0.952	0.8	yes
Food Security Value	FSE1	0.929			
	FSE2	0.921			
	FSE3	0.792			
	FSE4	0.921			
	FSE5	0.902			

Source: Developed by the authors

3.4 Scale refinement

At this stage, the goal was to confirm the scale factor structure. The survey was carried out with farmers markets consumers, mostly at the time of purchase to examine the scale psychometric properties and stability. Four farmers markets in the state of Minas Gerais in Brazil were chosen for data collection. In the questionnaire the consumers were explained about the green food products meaning. The visits to the farmers markets occurred from the beginning of March 2021 to the beginning of May 2021. The researchers assured the confidentiality of the information provided by each consumer and they were not identified.

The sample of this study was composed of 519 respondents, after eliminating respondents for a variety of reasons. It reached a response rate of 86.2% of the total submitted questionnaire. The theoretical model was examined using SEM. Researchers examined the validity (convergent and discriminant) and reliability. The factor analysis, the measurement and structural tests were carried out using Smart Pls 3 software.

4 Results

4.1 Respondents' profile

The Table 2 describes the samples descriptive statistics. The vast majority of respondents were female in accordance to previous studies about farmers markets consumers (Mohammad et al., 2020). Researchers only interviewed consumers over 18 years old, which begin Brazilians' adulthood range and almost 60% of respondents were over 40 years old. More than a half of respondents were married, consistently with Vasconcelos Filho (2019). Approximately 70% of respondents had college degree or more, which showed respondents highly graduated. The highest average of respondents makes four to six minimum wage per month.

Table 2
Descriptive statistics of respondents.

	Research sample	
	N=519	**%**
Birth		
18 to 25 years old	60	11,56%
26 to 40 years old	155	29,87%
41 to 61 years old	207	39,88%
62 to 74 years old	90	17,34%
75 years old or more	7	1,35%
Gender		
Female	330	63,58%
Male	189	36,42%
Marital Status		
Single	164	31,60%
Married	288	55,49%
Widowed	16	3,08%
Divorced	51	9,83%
Scholar		
No schooling	7	1,35%
Less than high school	36	6,94%
High school	121	23,31%
College Degree	144	27,75%
Post-graduation	125	24,08%
Master's degree	58	11,18%
Doctorate degree	28	5,39%
Monthly Income		
Less than a minimum wage	14	2,70%
From 1 to 3 minimum wage	154	29,67%
From 4 to 6 minimum wage	146	28,13%
From 7 to 10 minimum wage	137	26,40%
More than 10 minimum wage	68	13,10%

Source: Developed by the authors

4.2 Descriptive statistics of variables

The data were examined for missing value, normality, outliers, and multicollinearity. It was found no major issues for those exams. From the standard deviation analysis, no outliers were found. From the skewedness and kurtosis analysis, it was found all variables were

normally distributed. Table 3 describes the descriptive analysis of GPV items. The data descriptive statistics showed the mean scores of all items were above three on a five-point Likert Scale demonstrating purchasing green food product is considered valuable by the consumers. The highest scores for each construct were: FSA1 (M=4,62); FSE5 and FSE2 (M=4,58); EV1 (M=4,55); FV3 (M=4,47); CV3 (M=4,41); SV1(M=3,81). As we could check, a variable from the food safety value had the highest scores among others.

Table 3
Total sample measurement model

	Mean	Std. Dev.	Outer loadings	C.A.	rho_A	C.R.	AVE	VIF
Functional value				825	837	884	656	2,235
FV1	4,32	1,04	829					
FV2	3,84	1,15	733					
FV3	4,47	1,02	835					
FV4	4,34	1,02	838					
Conditional value				854	861	911	773	1,380
CV1	4,18	1,24	912					
CV2	4,04	1,21	882					
CV3	4,41	1,11	843					
Social value				858	879	902	698	1,160
SV1	3,81	1,14	864					
SV2	3,78	1,11	823					
SV3	3,71	1,17	850					
SV4	3,77	1,17	803					
Emotional value				808	815	886	722	2,377
EV1	4,55	0,85	854					
EV2	4,04	1,07	817					
EV3	4,42	0,93	877					
F. Safety value				898	905	925	713	3,130
FSA1	4,62	0,83	899					
FSA2	4,19	1,00	737					
FSA3	4,31	0,97	838					
FSA4	4,51	0,89	883					
FSA5	4,47	0,89	856					
F. Security value				905	910	930	726	2,873
FSE1	4,55	0,89	893					
FSE2	4,58	0,82	881					
FSE3	4,20	1,02	765					
FSE4	4,47	0,90	890					
FSE5	4,58	0,84	825					

Source: Developed by the authors

4.3 Latent structure and scale purification

Researchers run a factor analysis aiming to discern the latent factor structure and refinement of the developed scale. All the measurement variables presenting outer loadings less than 0.50 would be removed (Sarstedt et al., 2019). The results of the factor analysis are presented in Table 3. The measurement variables adequately captured six first order constructs and contributed to the explanation of each construct. All six dimensions met the unidimensionality criterion. The factor analysis divided 24 items into six construct which all highly effect the GPV construct. Researchers performed the discriminant validity test. Researchers wanted to assure the constructs effectively measure the different aspects of the GPV scale. Table 4 shows all the constructs presented discriminant validity according Fornell and Larcker (1981) criteria.

Table 4
Discriminant validity

	Conditional	Emotional	F. Safety	F. Security	Functional	Social
Conditional	879					
Emotional	433	850				
F. Safety	427	699	845			
F. Security	402	666	774	852		
Functional	459	635	673	656	810	
Social	289	297	195	149	262	836

Source: Developed by the authors

Researchers also run a Heterotrait-Monotrait Ratio (HTMT) test based on Henseler, Ringle and Sarstedt (2015) providing another approach to access the constructs discriminant validity. Table 5 describe the HTMT scores, which it was possible to check all the values were lower than 0.90 accomplishing to HTMT criteria (Henseler et al., 2015).

Table 5
Heterotrait-Monotrait Ratio (HTMT)

	Conditional	Emotional	F. Safety	F. Security	Functional
Emotional value	511				
F. Safety value	475	815			
F. Security value	446	771	853		
Functional value	528	765	768	745	
Social value	332	354	221	158	310

Source: Developed by the authors

Based on the construct's outer loadings and the discriminant validity tests, researchers moved to next analysis for the construct validation.

4.4 Construct validation

Following the higher order construct theory, this model has been analyzed as a reflective-formative construct (Cheah et al., 2019). The PLS-SEM is the preferred approach when formative constructs are included in the structural model (Hair, Hult, Ringle, & Sarstedt,2016; Sarstedt et at., 2019). To better understand the GPV formative construct, researches evaluated the construct reliability and validity, the convergent validity, the collinearity of the indicators and the significance tests.

To test the constructs convergent validity, researchers used the criterion proposed by Fornell and Larcker (1981). The Average Extracted Variance (AVE) is guaranteed when the shared percentage variance among the latent construct and its indicators ranges from 0% to 100% (Hair, et al., 2009), is greater than 50% (Henseler, et al., 2009). Table 3 describes the AVE presented in the model. All the constructs presented AVE over 65%, demonstrating the convergent validity for all the constructs.

To measure the constructs reliability, researchers used the Cronbach's Alpha (C.A.) and Composite Reliability (C.R.). According to Tenenhaus et al. (2004) the C.A. and C.R indicators must be greater than 0.70 for constructs reliability, and for exploratory research scores over 0.60 are also accepted (Hair et. al., 2009). All the constructs presented Cronbach's Alpha over 0.80 and Composite Reliability over 0.88. These scores demonstrated the constructs reliability and validity, see Table3. Researchers yet presented the rho_A. All the scores were above 0.80 which also described the constructs reliability and validity.

Researchers also checked for potential collinearity among the lower-order constructs of GPV. The analysis of the model produces VIF values of 2.235 for Functional Value, 1.380 for Conditional Value, 1.160 for Social Value, 2.377 for Emotional Value, 3.130 for Food Safety Value, 2.873 for Food Security Value. Those scores are lower or around the value of 3 which demonstrated no collinearity issues (Hair et al., 2019).

The next step for the construct validation stage, researchers need to check the significance and relevance of the relationships between the six lower constructs and the second order GPV construct. The test was performed through a bootstrapping with 5000 subsamples, percentile method and a two-tail test type. Figure 2 show the results. Appeared as path coefficients in the PLS path model, these relationships represent the higher-order construct's weights (Hair et al., 2019). The social value constructs shown the smallest weight (6.429, P<0.001). The highest score was attributable to the Food Security construct towards the GPV (29.271, P<0.001). These results offer clear support for the validity of the reflective-formative higher-order construct scale.

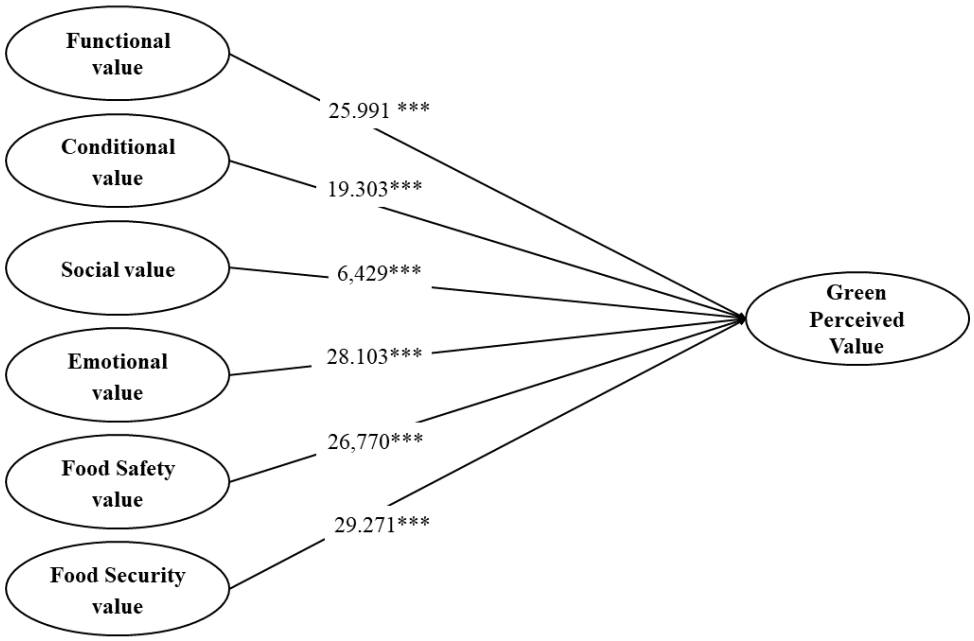

Figure 2. Second order confirmatory statistic analysis of Green Perceived Value.

4.5 Evaluation of reduced items

The validation of the GPV model developed in this study was based in the previous multinomial GPV scale which adopted four constructs (social value, functional value, emotional value, conditional value). Including the food safety and food security constructs new items were added in the GPV scale measurement. Therefore, the load over the respondents can increase with the addition in number of measurement items. It is important to examine a possibility to construct the GPV scale with less number of measurement items (Widaman, Little, Preacher, & Sawalani, 2011).

Researchers removed two items from the food safety construct (FSA2, FSA3) and food security constructs (FSE3, FSE5). The items were chosen based on the lower factor loadings. The proposed reduced scale become with 20 items. New tests for significance and relevance of the constructs reduced items were done. However, the significance of both construct (food safety and food security) has been reduced toward the GPV scale. Some of important

measurement items have been removed and the proposed 24 items measurement scale were appropriated for examining the values perceived by green food consumers.

5 Discussion

Findings suggest food safety and food security values are positively related to the GPV, thus the hypotheses 1 and 2 were confirmed. Both, food safety and food security values in addition to the social value, functional value, emotional value, conditional value are shown to predict the GPV by green food consumers. Some interesting analysis can be done by the inclusion of food safety and food security values. For example, the highest and positive relation perceived by green food products buyers comes from the food security value. This finding suggest consumers perceived that a non-sustainable food system would damage the eco-system, produces more food wastage, increase chemicals emission impairing environment.

Independently from consumers concerns toward health and environment, the functional and conditional value also highly influence green food buyers. These results follow previous findings (Sangroya & Nayak, 2017; Woo & Kim, 2019). More specifically, in this study the function and conditional values represented consumers' value for money, price, quality, discounts, promotional incentives and easy availability. It demonstrates the need of an integrated effort of politicians, producers and governments to facilitate the access of green food products for the consumers. Targeted discounts and subsidies may help certain segments of green food consumers to purchase green food products.

Previous studies support the knowledge that consumption based on positive values leads to affirmative emotions at consumers subconscious level (Sheth et al., 1991; Wiedmann et al., 2007). Adding two new constructs to the scale, researchers show that positive emotional values related to green food purchase go beyond the positive notion related to price, or quality or accessibility. The values related to food safety and food security also contributes to consumers positive feelings. The combination of all these values resembles the emotional relax, good feelings and joy of buying a green food product. Based on these findings, producers, handlers, and retailer of green foods should increase consumers knowledge about the benefits of a green food product. Their focus can be price, incentives, quality, but also and specially the health and environmental benefits from consumers purchase.

The social value has also proven to positive influence green food products purchase. The fact that social value was the less important value related to green food purchase complements previous studies like Woo and Kim (2019); Sangroya and Nayak (2017). Green food buyers cares about the social context importance. Yet, it goes farther. Consumers also takes the health and environmental concerns into their social habits and relationships when purchasing a green food product.

6 Conclusion

The main purpose of this study was to validate a new proposal of a GPV Scale. Based on reliability and validity tests, the scale proved to be robust and credible. This study proposes that food safety and food security aligned with the functional value, conditional value, emotional value and social value influence consumer GPV. To address this influence process, researchers investigated farmers market consumers and the values they consider for green food product purchase. Through a SEM we found the proposed values significantly influencing consumers GPV. The expanded scale proved to be reliable as it considers others constructs that were not measured before.

Nowadays food consumption and production has become unsustainable. Results from this study shed lights on six values influencing green food consumers and how they perceive

green product values. The scale can be applied to evaluate consumers' perception toward green food product. Such knowledge can be used to promote strategies to foment consumers usage of green food products. For example, on a marketing campaign development, farmers have a helpful tool to understand consumers perception, which might approximate consumers to their produce.

Our findings highlight the importance to not only focus on financial, or quality, or the access of green food products, but especially important on the food safety and food security aspects, which are aligned with emotional aspects. The scale is a helpful tool for policy makers to design and deliver programs encouraging the consumption of green foods, which in turn will impact government responsibility to the environment and a sustainable society. Not only for that, a recent study from Lee, Bae and Kim (2020) informed that not all the companies environmental cues provided on their products, have the intended effect. Bearing that in mind, green food producers and managers, can use the scale results to create labels to tap into consumers' emotions and access these specific market segment. The success of their sales might be hit through a consumer GPV exam.

Lastly, the present study advances the existing literature by adding two new constructs to the aforementioned ones and, contributing to the multidimensional aspects of the scale. According to what was proposed to Sangroya and Nayak (2017), the addition of the two other constructs (food safety and food security) has proven to be significant to the GPV. From the previous definition of the GPV theory, firstly proposed by Chen and Chang (2012) we would propose to include the health subject on it, when related to food. We propose the definition of GPV as "a general consumer assessment of the net benefits of a product or service between what is received and what is given based on the consumer's environmental desires, health, sustainable expectations and green needs".

Reference

Alam, M. K., Bell, R. W., & Biswas, W. K. (2019). Increases in soil sequestered carbon under conservation agriculture cropping decrease the estimated greenhouse gas emissions of wetland rice using life cycle assessment. *Journal of Cleaner Production,* 224, 72-87.

Armanda, D. T., Guinée, J. B., & Tukker, A. (2019). The second green revolution: Innovative urban agriculture's contribution to food security and sustainability–A review. *Global Food Security*, 22, 13-24.

Aschemann-Witzel, J., & Niebuhr Aagaard, E. M. (2014). Elaborating on the attitude–behaviour gap regarding organic products: young Danish consumers and in-store food choice. *International Journal of Consumer Studies,* 38(5), 550-558.

Azzurra, A., Massimiliano, A., & Angela, M. (2019). Measuring sustainable food consumption: A case study on organic food. *Sustainable production and consumption,* 17, 95-107.

Bearth, A., Cousin, M. E., & Siegrist, M. (2014). Poultry consumers' behaviour, risk perception and knowledge related to campylobacteriosis and domestic food safety. *Food Control,* 44, 166-176.

Cheah, J. H., Ting, H., Ramayah, T., Memon, M. A., Cham, T. H., & Ciavolino, E. (2019). A comparison of five reflective–formative estimation approaches: reconsideration and recommendations for tourism research. *Quality & Quantity*, 53(3), 1421-1458.

Chen, Y. & Chang, C. (2012), Enhance green purchase intentions: the roles of green perceived value, green perceived risk, and green trust, *Management Decision*, 50(3), 502-520.

Churchill Jr, G. A. (1979). A paradigm for developing better measures of marketing constructs. *Journal of marketing research*, 16(1), 64-73.

Duong, D. T. (2020). Sustainable development for Vietnam agriculture. In *E3S Web of Conferences,* 175, p. 01015. EDP Sciences.

Douglas, S. P., & Craig, C. S. (2007). Collaborative and iterative translation: An alternative approach to back translation. *Journal of International Marketing*, 15(1), 30-43.

Eyhorn, F., Muller, A., Reganold, J. P., Frison, E., Herren, H. R., Luttikholt, L., … Smith, P. (2019). Sustainability in global agriculture driven by organic farming. *Nature Sustainability*, 2(4), 253-255.

Fornell, C. G. & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 18(1), 39-50.

Gizaw, Z. (2019). Public health risks related to food safety issues in the food market: A systematic literature review. *Environmental health and preventive medicine*, 24(1), 68.

Ha, T. M., Shakur, S., & Do, K. H. P. (2019). Consumer concern about food safety in Hanoi, Vietnam. *Food Control*, 98, 238-244.

Han, L., Wang, L., Zho, S. & Li, J. (2017). The intention to adopt electric vehicles: driven by functional and non-functional values. *Transportation Research*, 103, 185-197.

Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). *When to use and how to report the results of PLS-SEM*. European business review.

Hair Jr, J. F., Hult, G. T. M., Ringle, C., & Sarstedt, M. (2016). *A primer on partial least squares structural equation modeling (PLS-SEM)*. Sage publications.

Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. L. (2009). *Análise multivariada de dados*. Bookman editora.

Hartmann, P., & Ibanez, V. A. (2006). Green value added. *Marketing Intelligence & Planning*, 24(7), 673-680.

Hatton, C. (2015). Will China's New Food Safety Rules Work? Retrieved May 25, 2021, from http://www.bbc.com/news/blogs-china-blog-34398412

Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the academy of marketing science*, 43(1), 115-135.

Henseler, J., Ringle, C. M., & Sinkovics, R. R. (2009). The use of partial least squares path modeling in international marketing. In *New challenges to international marketing*. Emerald Group Publishing Limited.

Henson, S., & Traill, B. (1993). The demand for food safety: Market imperfections and the role of government. *Food Policy*, 18(2), 152-162.

Jarvis, C., MacKenzie, S. B., & Podsakoff, P. M. (2003). A critical review of construct indicators and measurement model misspecification in marketing and consumer research. *Journal of Consumer Research,* 30, 199-218.

Lee, E. J., Bae, J., & Kim, K. H. (2020). The effect of environmental cues on the purchase intention of sustainable products. *Journal of Business Research*, 120, 425-433.

Lin, C. H., Sher, P. J., & Shih, H. Y. (2005). Past progress and future directions in conceptualizing customer perceived value. *International Journal of Service Industry Management*. 16(4), 318-336.

Liu, H. B., McCarthy, B., & Chen, T. (2016). Green food consumption in China: Segmentation based on attitudes toward food safety. *Journal of International Food & Agribusiness Marketing*, 28(4), 346-362.

Menozzi, D., Sogari, G., Veneziani, M., Simoni, E., & Mora, C. (2017). Eating novel foods: An application of the Theory of Planned Behaviour to predict the consumption of an insect-based product. *Food quality and preference*, 59, 27-34.

Mohammad, A. M., Chowdhury, T., Biswas, B., & Absar, N. (2018). Food poisoning and intoxication: a global leading concern for human health. In *Food Safety and Preservation,* 307-352. Academic Press.

Mohammad, Z. H., Yu, H., Neal, J. A., Gibson, K. E., & Sirsat, S. A. (2020). Food safety challenges and barriers in southern United States farmers markets. *Foods*, 9(1), 1-12.

Persaud, A., & Schillo, S. R. (2017). Purchasing organic products: role of social context and consumer innovativeness. *Marketing Intelligence & Planning,* 35(1), 130-146.

Rather I. A., Koh W. Y., Paek W. K., & Lim J. (2017) The sources of chemical contaminants in food and their health implications. *Frontiers Pharmacology,* 8, 830.

Sanchez, G. (2013). PLS path modeling with R. *Berkeley: Trowchez Editions*, *383*, 2013.

Sangroya, D., & Nayak, J. K. (2017). Factors influencing buying behaviour of green energy consumer. *Journal of Cleaner Production*, 151, 393-405.

Sarstedt, M., Hair Jr, J. F., Cheah, J. H., Becker, J. M., & Ringle, C. M. (2019). How to specify, estimate, and validate higher-order constructs in PLS-SEM. *Australasian Marketing Journal*, 27(3), 197-211.

Sheth, J. N., Newman, B. I., & Gross, B. L. (1991). Why we buy what we buy: a theory of consumption values. *Journal of Business Research*, 22(2), 159-170.

Silva Filho, O. J. D., & Gomes Júnior, N. N. (2020). O amanhã vai à mesa: abastecimento alimentar e COVID-19. *Cadernos de Saúde Pública*, 36.

Suki, N. M. (2016). Green product purchase intention: impact of green brands, attitude, and knowledge. *British Food Journal*, 118(12), 2893-2910.

Soroka, A., & Wojciechowska-Solis, J. (2019). Consumer Motivation to Buy Organic Food Depends on Lifestyle. *Foods*, 8(11), 581.

Tenenhaus, M., Amato, S., & Esposito Vinzi, V. (2004). A global goodness-of-fit index for PLS structural equation modelling. In *Proceedings of the XLII SIS scientific meeting*, 1, 739-742.

Troudi, H., & Bouyoucef, D. (2020). Predicting purchasing behavior of green food in Algerian context. *EuroMed Journal of Business,* 15(1), 1-21.

Vasconcelos Filho, B. G. D. (2019). A feira livre de delmiro gouveia, alagoas, e seus feirantes.

Widaman, K. F., Little, T. D., Preacher, K. J., & Sawalani, G. M. (2011). On creating and using short forms of scales in secondary research.

Wiedmann, K., Hennigs, N., & Siebels, A. (2007). Measuring consumers' luxury value perception: a cross-cultural framework. *Acad. Mark. Sci*. 7(7), 333-361.

Willett, W., Rockström, J., Loken, B., Springmann, M., Lang, Vermeulen, S., … Murray, C. J. L. (2019). Food in the Anthropocene: the EAT–Lancet Commission on healthy diets from sustainable food systems. *The Lancet*, 393(10170), 447-492.

Wong, W. M., & Tzeng, S. Y. (2019). Consumers' Psychographics and Green Consumption Intention: Community Supported Agriculture Business Model in China. *International Journal of Business and Society*, *20*(1), 229-246.

Woo, E., & Kim, Y. G. (2019). Consumer attitudes and buying behavior for green food products. *British Food Journal,* 121(2), 320-332.

World Health Organization. The world health report 2001- Mental Health: New Understanding, New Hope. 2001. http://www.who.int/whr/2001/en/whr01_en.pdf (accessed June 1, 2021).

Yogananda, A. P. Y., & Nair, P. B. (2019). Green Food Product Purchase Intention: Factors Influencing Malaysian Consumers. *Pertanika Journal of Social Sciences and Humanities*, 27(2), 1131-1144.

Yu, X., Gao, Z., & Zeng, Y. (2014). Willingness to pay for the "green food" in China. *Food Policy*, 45, 80-87.

Zhang, B., Fu, Z., Huang, J., Wang, J., Xu, S., & Zhang, L. (2018). Consumers' perceptions, purchase intention, and willingness to pay a premium price for safe vegetables: A case study of Beijing, China. *Journal of cleaner production*, 197, 1498-1507.