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BUYING FOOD ONLINE: WHAT EXPLAINS THE CONSUMER PURCHASE BEHAVIOUR?

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Abstract

The motivations of the consumer when he or she is buying food online remain unknown. This is one of the first research to review the general motivations that the consumer presents when making the decision to purchase food using electronic commerce as a purchase channel. A virtual food shopping experiment was conducted for 30 weeks and 223 responses were obtained from shoppers with different demographic characteristics. Motivations were modelled using Stimulus-Organism-Response (SOR) framework and solved by structural equations (SEM) in total, it was possible to obtain significant responses for 14 effects. Results indicate that convenience associated with ease of use and hedonic motivations are the motivations with the greatest influence on the consumers' purchasing response. It was possible to determine, among other things, that variables such as socioeconomic status do not strongly influence the response in the virtual purchase of food.

Keywords: Consumer motivations, e-commerce, economic behaviour, food retail, SEM

Jel Codes: D12, C31, D91, D47

1. Introduction

Food commerce has become into an activity that occupies the efforts and interests of policy makers, academics, and the business sector, where the utilization that societies dictate over these goods have considerable impacts not only at an economic level, but also at the environmental and social stage. For the American continent, international commerce of these goods reached a value close to USD 318 billion for the year 2017 (FAOSTAT, 2017), this implies an important activity for the development of the economies of the continent.

This activity has found, partially credited to new commercial practices that have been developed since the creation of the Internet, a new scenario of challenges and opportunities towards the future. The different attitudes and behaviours related with people and the mobility with which goods are electronically commercialized (Eastin & Brinson, 2017) make e-commerce (EC) the most up to date expression of this new scenario.

As a medium to increase the interaction between consumers and suppliers of goods and services, EC has grown at a constant rhythm in recent years particularly since 2000. It is estimated that the value of electronic transactions reached USD 7,8 billion in 1998 (Brynjolfsson & Smith, 2000); for the year 2000 this value had achieved USD 282 billion and in 2005 USD 4,3 trillion (Wen, 2007), which corresponds to an annual average growth of 7,8%.

The economic impact that EC has on world powers such as China and United States is relevant. Recent studies indicate that for the Chinese case "group buying" made in the year 2014 through EC accounted for a total of 173 million people (Jeon et al., 2017) meanwhile, for

the American case in the year 2015 (Raphaeli et al., 2017) EC income was estimated at USD 340,9 billion for its economy.

The magnitude of global change on this matter is significant and has occurred particularly because of the exchange of goods and services of diverse origins in which agricultural goods have taken part of this list not until very recently. Some works have been oriented towards small retail sales of food in which the authors have paid attention to aspects like the design of EC sites that could offer these types of product in comparison to physical stores, where comparing the varied formats it was found that the combination of a squared and free type style can enhance the buying experience of the consumer (Vrechopoulos et al., 2004).

Product presentation on the EC site oriented for the potential buyer has also been investigated (Breugelmans & Campo, 2011). For instance, from the ten categories detailed in the previously cited investigation, it was concluded that the strategy followed by convenience stores associated with the identification of the product through promotional signs and advertisements is equally beneficial for online product sale.

Other authors (Hussain et al., 2018) developed a study of the motivations that people use when making the decision of buying agricultural products using EC. The authors conclude that for the case of food, the quality of the information that is given to the potential buyer through the internet is of great relevance because of the impact on purchase behaviour that could be presented in the future. Therefore, website administrators that sell food should constantly monitor the quality and pertinence of the information that people receive.

The idea of investigating the way in that people respond to diverse stimuli in EC environments is not new. Many studies refer to the EC topic and the impulse that consumers follow to make the decision of buying goods using this channel, this could allow to approximate on a convenient way for the effects of this work the stimuli received by the consumer that eventually will make him/her make these types of purchase decisions.

The objective of this investigation was to analyse the motivations derived from applying EC as a channel to acquire said goods, to prioritize the incentives that influence on a relevant way the purchase response of the consumer. The investigation is presented in the following manner: section 2 exposes the theoretical framework that emphasizes on the stimuli and proposed model. In section 3 the material and methods are described. Section 4 presents the results of the model, section 5 shows the discussion of said results and finally in section 6, general conclusions of the investigation are provided.

2. Theoretical Framework

In order to achieve the objective, the Stimulus-Organism-Response (SOR) was defined as a theoretical referent which presented a challenge when establishing a series of stimuli that would determine the hierarchy and interaction over the diverse motivations that people can have when using EC as a means of buying agri-food goods. Consequently, initially the stimuli were established and tested, then the structuring of the reflection process developed by the individuals in favour of their own virtue was developed and moreover prioritize the given answers. This was achieved with the support of mathematical models that were validated with this aim.

The SOR approach was applied in six of a total 34 studies on the evaluation of EC and the consumers' answer, occupying the first place as preference by the research teams that developed said studies (Chan et al., 2017). In the work of Chan et al (op.cit), it is considered that SOR theory achieves factor classification that affects the purchases of online products. SOR also differs from the classical concept applied by environmental psychology that assumes individuals, given specific stimuli, produce different responses to a specific phenomenon (Chan et al, op.cit.).

2.1 Endogenous Stimuli Considered

In this research five latent variable groups were taken into consideration of endogenous type; these contain the motivations and stimuli that were evaluated in the end consumer of food.

The following stimuli were considered for the model testing:

a) The confidence (CF) on online shopping. Many studies (Doong & Wang, 2011; Liao et al., 2011; Martínez-López et al., 2014; Pavlou, 2003) highlight that the confidence of consumers is an important stimuli when making online purchases. Inside this category, familiarity that the potential buyer will have with the e-commerce site as well as the paying methods are considered. To evaluate the confidence, the following indicative variables were defined: 1) confidence in commentaries of other buyers (CF2), 2) confidence in the promise of quality offered by the web site (CF3), 3) confidence in the information on the producer offered by the web site (CF4), 4) confidence in the suggestions that can be received by the e-commerce website to support food shopping (CF5).

b) The convenience (CO) of making purchases of food online. The convenience is presented as a strong stimulus for online shopping (J. B. Kim, 2012; Martínez-López et al., 2014; Ramus & Asger Nielsen, 2005; Vakulenko et al., 2018), reason why it was analysed as part of the proposed model. As CO indicative variables, the following were established: 1) Buying food through e-commerce makes life easier (CO1), 2) the shopping website provides abundant information related with the functions and qualities of the products (CO3), 3) the purchase of food in e-commerce websites is something easy for me (CO4), 4) considering the effort made in buying food using the e-commerce site, I think that online shopping is worthwhile (CO5), 5) buying food in e-commerce sites is riskier than buying these products other ways like the farmers' market or supermarkets (CO6).

c) The pleasure (HD) of buying online. As part of the stimuli that are considered in the moment of understanding the reflections that people consider for purchase decisions, those of hedonic nature complement the ones of utilitarian type. In stimulus a) and b) the variables gathered are to evaluate utilitarian conduct. For the hedonic variables or those associated to behaviours explained by pleasure found in purchase using EC, the propositions made by authors that have sought to understand the way in that people make purchases particularly by the pleasure that this action generates are followed (Cai & Xu, 2006; Fang et al., 2016), with this the intention is to manage the two types of behaviours that could influence in the final purchase decision. Because of this, the following variables were determined: 1) the time used in the e-commerce site was really pleasing (HD1), 2) the pleasure of using this e-commerce site not only because of the articles that can be bought (HD2) and 3) the pleasure of visiting the EC site (HD3).

d) Economic stimuli (IE) when purchasing food online. Several authors (Eastlick & Feinberg, 1999; Schierz et al., 2010; Teo & Yu, 2005) analysed the relevance with which economic impulses determine purchasing decisions through virtual channels. For the present research, the following variables were determined: 1) The savings that can be generated when buying in e-commerce sites (IE1), 2) the time and effort necessary for the purchase decision of these types of products (IE2), 3) the easiness in which one can be skilful when buying food on e-commerce sites (IE4), 4) learning to buy food on e-commerce sites was (would be) easy for me (IE5).

e) The consumers' response on buying food online. These relations are presented accordingly to the suggestions made by various works (Floh & Madlberger, 2013; C. Kim et al., 2012; H.-W. Kim et al., 2012) that present for the purchase of goods and the level of expenditure, as well as the future intentions of purchasing through this channel, in addition to the general satisfaction of using EC.

The following observable variables for this stimulus were defined: 1) the future probabilities of making online purchases (R1), 2) the general satisfaction of the consumer on the experience of buying (R2) in addition to 3) the perception of food expenditure made online in contrast to the usual consumption that the person presents for these types of goods (R3).

2.2 Exogenous Stimuli Considered

Five groups of exogenous stimuli were considered that allow to model the answers of consumers:

f) Socioeconomic status of the consumer (SES): To characterize this group, the following indicative variables were utilized: 1) Age of the consumer (ED), 2) most recent academic degree (ESCO), 3) nuclear family income in USD^{1/} (INC).

g) Family food consumption history (HCONS): This group was characterized by the variables: 1) Weekly frequency of food purchase (FRQ_C), 2) the individuals' decision on the food consumed in their household (DES_CONS), 3) primary nuclear family size (FAM).

h) Purchase decision by gender (TDEC): This variable was characterized by consumers' sex (GEN).

i) Preference of other food purchasing channels (PREF): This variable was characterized by 1) Level of preference for buying food through farmers' markets (FERIA_PREF), 2) level of preference for buying food through supermarkets (SUPER_PREF), 3) level of preference for buying food through the internet (INT_PREF).

j) Experience using the internet (EXP): This variable was characterized by the weekly frequency usage of the internet of the consumer (INT_O).

2.3 Proposed Model

The SOR proposed model (Figure 1) supposes an appropriate conceptual framework in order to qualify the impulses and motivations that generate a purchase response on the consumer by EC, this was particularly considered using the same logic and aim.

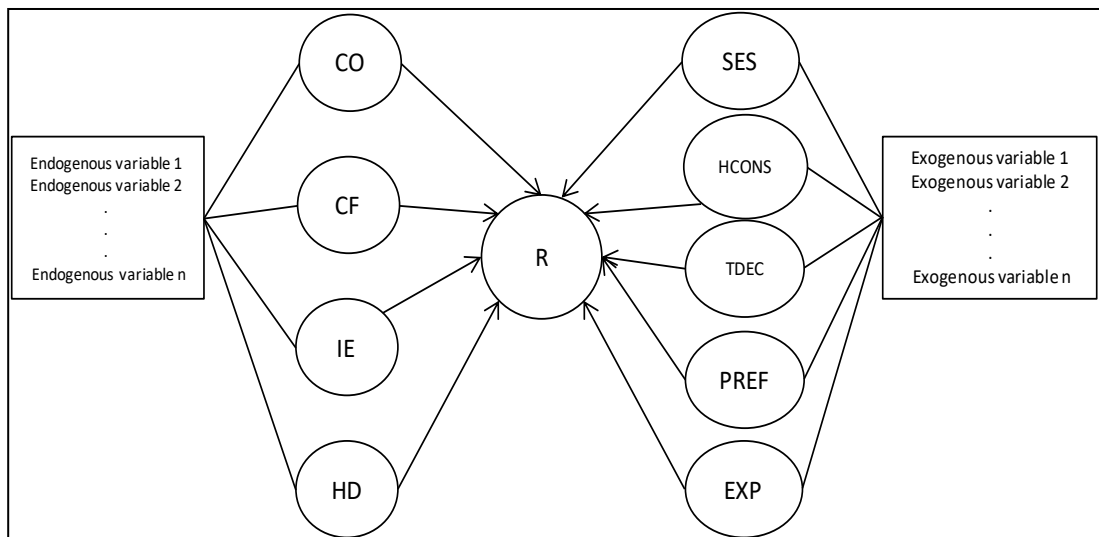


Figure 1. Proposed SOR Model to Evaluate Purchase Motivations Using EC of The Food Consumer

For the purpose of implementing the SOR model and systematize the data on a convenient manner, the method of econometric modelling using structural equations (SEM) was reviewed due to the adequate treatment provided for the objectives established in this research.

This type of modelling allows to test the existing relations between a theoretical approach and empirical data that seek to validate it. The adjustment made supposes the following types of concepts: 1. Theoretical concepts, 2. Empirical concepts and 3. Derived concepts or non-observable different to theoretical concepts (Haenlein & Kaplan, 2004). One of the advantages of applying SEM is that the integration of two techniques for the multivariate data analysis is possible:

1. Representation of the SOR model: The model that represent the theory is constructed when converting the theoretical and derived concepts in latent variables (non-observable) and the empirical concepts into indicators which are linked by a hypothesis group that relate them.

2. Path diagram: The research model is presented graphically, this allows the observable variables, internal and external to the phenomenon wanted to be modelled, as well as those that are non-observable, internal and external, be available for testing. The abovementioned path diagram follows the classical approach of Wright (Shipley, 2016).

In order to confirm the validity of the model the following work hypothesis were raised:

Hypothesis 1: A stronger causality relation from the endogenous stimuli exists in comparison to those of exogenous stimuli over the purchase response given by the food consumer through EC.

Hypothesis 2: The utilitarian stimuli presents greater influence over the response of the food consumer through EC in comparison to the hedonic stimuli.

3. Materials and Methods

3.1 Description of the performed experiment

The data was collected as of an experiment using the web site of the Agroferiaproject of the University of Costa Rica (UCR). The Agroferia UCR²project is an initiative made by the university's Faculty of Agricultural Sciences directed towards the empowerment of various actors of the agricultural sector, the creation of new knowledge and the support of the teaching-learning process on topics regarding commerce of goods and services of agricultural origin. The data collection was carried out between the months of February and November of 2019.

The experiment was founded following the experimental economics approach (Smith, 1989), that exposes that economics should be an exercise on the observation of reality and not one based on theoretical foundations. Food purchasing situations were proposed with scenarios that would let the participants analyse their decisions and implications as if they were in front of a real situation.

Throughout 30 weekly sessions of online shopping, 171 products of the following types were offered: nuts and grains, coffee, vegetables, fresh fruits, and agri-food products with some level of processing (honey, orange juice, sauces, marmalades). The access to the electronic site was limited to officials with active appointment as employees at University of Costa Rica. Each person that took part of this population disposes of a personal identificatory at a data base level which allows to validate the officials' access to the different computer systems that belong to the administrative area of the University.

To incentivize survey participation, an economic incentive was offered for weekly draws of purchase orders on the research' website. It was requested for participants to complete an online questionnaire one time.

3.2 Stimuli Considered as Purchase Motivators Using EC

The studied stimuli were endogenous and exogenous, in the first group five non-observable or latent variables were considered based on the definition of different authors (Beaujean, 2014; Kline, 2011; Ramlall, 2017) as well as five exogenous latent variables.

The abovementioned were at the same time integrated by 30 observable variables that were requested to the consumer population applying a questionnaire composed by 32 questions. The endogenous variables were evaluated applying a Likert scale from 1 to 5 on a parallel manner in comparison to different authors on the EC topic applying a scale that ranges from: “Very in disagreement with the affirmation (1)” to “Very in agreement with the affirmation (5)” (Doong y Wang 2011, Kim et al. 2012, 2012, Liao et al. 2011, Martínez-López et al. 2014, Schierz et al. 2010).

A pilot test was developed with university teachers with experience on the application of surveys in order to check the questions’ relevance and the previously established latent variables, moreover the final version of the questionnaire was defined were five original questions were dismissed. The questionnaire was applied using the LimeSurvey® platform, the Cronbachs’ Alpha was calculated using the SPSS ® version 25 software to proof the reliability and/or consistency of the data obtained adding to the final data summaries of the demographic information on the respondents.

Table 1. Demographic Information of the Surveyed Population by Total Percentage (n=223).

Demographic Variable	Classification	Out of Total Percentage (%)
Sex	Man	17,9
	Woman	82,1
Scholarity	Highschool finished	12,1
	University baccalaureate	21,5
	Post-graduate	29,1
	Masters’ degree	27,8
	Doctoral degree	5,4
	Other	4,0
Household income (USD/month)	Up to 847	22,9
	Between 848 y 1.695	28,7
	Between 1.696 y 2.542	16,1
	Between 2.543 y 3.390	14,3
	Between 3.391 y 5.085	11,7
	More than 5.085	6,3
Family members	Lives alone	13,5
	Two people	37,2
	Three people	21,5
	Four people	20,6
	More than four people	7,2

3.3 Sample Characterization and Model Solution

The sample composed by 233 surveys was proceeded to by characterized. The survey respondents were in majority women with university studies (Table 1). The sample was composed by consumers that made at least one purchase through the website of the Agroferia UCR in the experimental periods, were it was possible to obtain a superior sample size in

comparison to another investigation (Westland, 2010) for samples where structural equation models are used:

$$n \geq 50r^2 - 450r + 1100$$

$$n \geq 50 \left(\frac{30}{10}\right)^2 - 450 \left(\frac{30}{10}\right) + 1100$$

$$n \geq 200$$

Were:

r = Relation between observable variables and latent variables of the model

n = Minimum sample size

For this research the LAVAAN (*Latent Variable Analysis* por sus siglas en inglés) (*The Lavaan Project*, 2020) package for R was applied in order to conduct the solution of the proposed model. In this evaluation a Confirmatory Factor Analysis (CFA) was employed to evaluate the validity of the performance model.

4. Results

4.1 Surveyed Population

Out of a population of 421 people that purchased in the research's period, a total of 273 completed the survey of both women and men between 21 and 72 years of age that bought food using the Agroferia UCR projects' website. After checking the total surveys, 50 cases were dismissed (18,3% of the total), generating a final sample size of 233 valid questionnaires. In Table 1 the general demographic information of the surveyed population is displayed.

4.2 Proposed Model Reliability

The motivations that the food consumer present in the moment of employing EC display a strong inclination towards CO, HD, and IE stimuli (Table 2). The direct effects obtained for the observable variables "Easiness to use perception (CO3-CO4-CO5)", "General pleasure when making purchases through virtual channels (HD1-HD2-HD3)" and "Necessary learning in order to buy using EC (IE4-IE5)" suggest standardized regression factors of 3,104; 2,818 y 1,463, respectively.

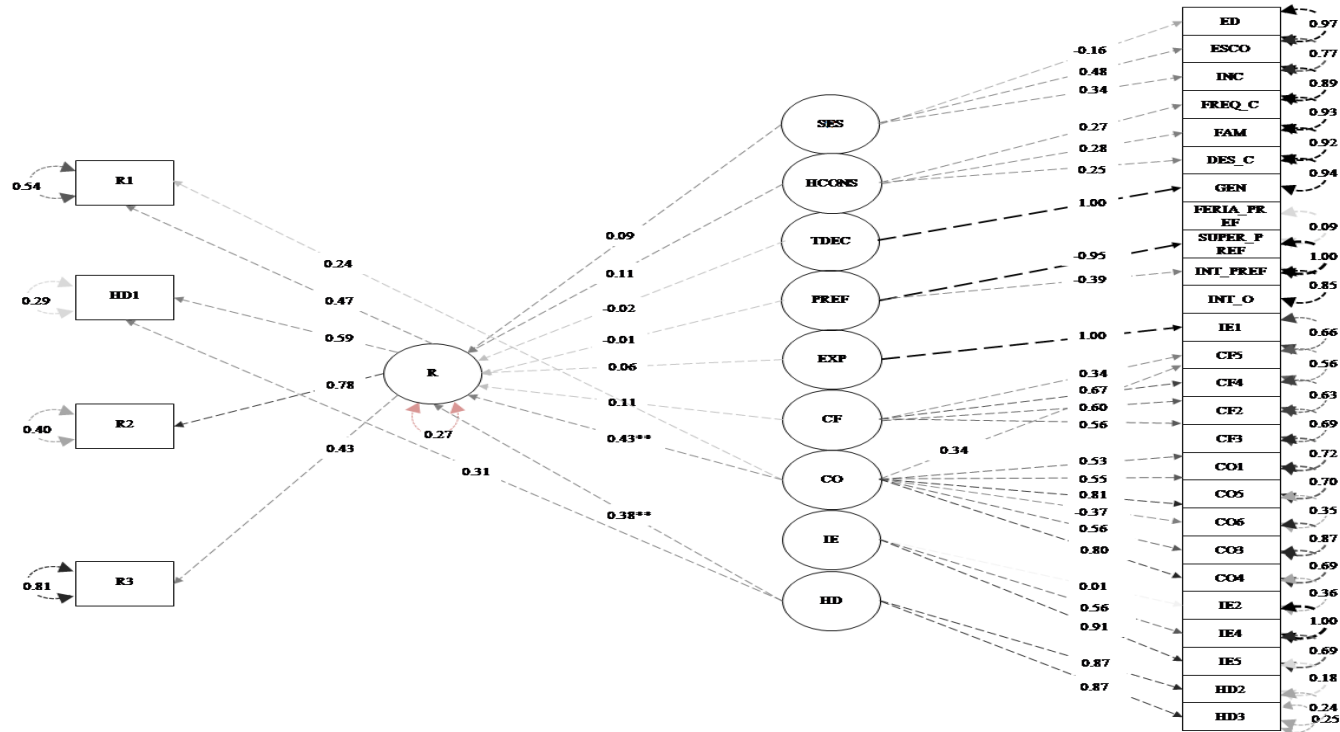
The SEM model proofed the existent relations between the 10 proposed latent variables with the variable "Purchase response of the consumer (R)", where it consists of the purchase response that the consumer will have when using EC. The results of the model presents a Cronbach's Alpha of 0,994 this indicates that the instrument is confident in line with the propositions of many authors (Liang & Huang, 1998; Teo & Yu, 2005). The statistical significance (p -value < 0,05) appears for 14 total effects of the 30 variables under study in the Confirmatory Factor Analysis that was applied (measurement model), this supports the supposition that the calculated structural model is plausible to present itself in the purchase context of the study's population. The Satorra-Bentler (Satorra & Bentler, 2001) was applied in order to obtain a robust version of the model and estimate the adjustment indices ($CFI_{robust} \cong 0,9$; $TLLI_{robust} \cong 0,9$; $SRMR_{robust} \cong 0,07$; $RMSEA_{robust} \cong 0,05$). Based on the explanations of Beaujean (2014), the adjustment values obtained for the model are found between the adequate levels for SEM models. The value of $\chi^2 = 508,617$ for the models' test applied was significant (p -value < 0,05) which could be due to that the sample size $n > 200$ generates these types of situations in SEM models for big samples, this coincides with that indicated by various authors on the matter (Kline, 2011 pp. 200-201; Ramlall, 2017 pp. 65).

Table 2 Standardized direct, indirect, and total effects of the variables employed in the structural proposed model regarding food consumer through EC response (N=223)^{a/}

Code of the question	Latent variables ^{1/}	Latent variable effect	Effects		
			Direct	Indirect	Total
ED	SES	0,091	-0,158	-0,014	-0,172
ESCO			0,479**	0,044	0,523
INC			0,339**	0,044	0,383
FREQ_C	HCONS	0,106	0,268**	0,028	0,296
FAM			0,280**	0,028	0,308
DES_CONS			0,248**	0,028	0,276
GEN	TDEC	-0,018	1,000**	-0,018	0,982
FERIA_PREF	PREF	-0,007	-0,952**	0,007	-0,945
SUPER_PREF			0,057	0,000	0,057
INT_PREF			-0,385**	0,003	0,382
INT_O	EXP	0,058	1,000**	0,058	1,058
IE1	CF	0,111	0,340**	0,038	0,378
CF5			0,665**	0,074	0,739
CF4			0,605**	0,067	0,672
CF2			0,556**	0,062	0,618
IE1	CO	0,433**	0,340**	0,147**	0,487**
CF3			0,534**	0,059	0,593
CO1			0,550**	0,238*	0,788*
CO5			0,808**	0,350**	1,158**
CO6			-0,367**	-0,159*	-0,526*
CO3			0,556**	0,241**	0,797**
CO4			0,802**	0,347**	1,149**
R1			0,244**	0,106**	0,350**
IE2	IE	0,051	0,010	0,001	0,011
IE4			0,556**	0,028	0,584
IE5			0,907**	0,046	0,953
HD1	HD	0,375**	0,308**	0,116**	0,424**
HD2			0,874**	0,328**	1,202**
HD3			0,867**	0,325**	1,192**
R1	R	-	0,469**	-	0,469**
R2			0,775**	-	0,775**
R3			0,431**	-	0,431**
HD1			0,592**	-	0,592**

Notes:^{1/}SES= Socioeconomic status, HCONS= Household history, TDEC= Food purchase decisions, PREF=Preference of other food purchasing channels, EXP= Experience using the internet, CF= Confidence, CO=Convenience, IE= Economic stimuli, HD= Hedonic incentives when buying, R= The consumers' response on buying food online.

^{a/}(*=significance smaller than 0.05 for a SEM modelling *= significance smaller than 0.10).



Note:^{b/} (**= 0.05 significance for latent variables) SES= Socioeconomic status of the consumer, HCONS= Family food consumption history, TDEC= Purchase decisions by gender, PREF=Preference of other food purchasing channels, EXP= Experience using the internet, CF= Confidence, CO=Convenience, IE= Economic stimuli, HD= Hedonic purchase incentives, R= General consumer response.

Figure 2 Path Diagram for The S-O-R Model of the Variables Associated with the Consumers' Motivation at the Moment of Purchasing Food Products through Virtual Channels^{b/}

The total effect of the stimuli evidence that age (ED) and risk perception of the consumer towards food purchase using EC in comparison to other commercialization channels such as farmers' market and supermarkets (CO6) were negative which indicates that in order to add consumer purchase response in the magnitude of one standard deviation both stimuli should lessen in the respective magnitudes of the obtained factor. For the first case (ED) the model does not report a significative value at 5% meanwhile for the second case (CO6) does, both when being mediated through their respective latent variables.

On the other hand, the mediation effect for the indicative variables can be determined by the differences between magnitudes of the indirect observed effects. This is particularly precise for the convenience variable (CO) where the totality of the motivations that would be mediated by this stimulus present a significance inferior to 5% (see Figure 2). It is also observed that the magnitude of the indirect effect for the motivators, improvements on quality of life (CO1), perception on the convenience of EC sites (CO3), general convenience when buying food using EC (CO4) and the perception on easiness to use (CO5 and CO6) reveal effects of almost a third part of the total effect which allows to evidence that these types of stimuli group those of greater relevance on purchase decision.

Additionally, the model allows to evidence a strong indirect effect produces by the answers obtained for the questions "Considering the effort made in buying food using the e-commerce site, I think that online shopping is worthwhile (CO5)", "I found pleasure of using this e-commerce site not only because of the articles that can be bought (HD2)" and "I found enjoyable visiting the EC site (HD3)" mainly. This implies that for consumers that perceive the convenience of purchasing food using EC due to the general value that implicate them (CO5) owes to the fact that this value is associated with the general convenience perceived when buying food through EC; for the case of the indirect effects observed in HD2 and HD3 these suggest that the buying experience using EC for these consumers is mainly due to the pleasure that in general motivated the purchase through said channel.

Regarding the covariances that are presented between the latent variables, it was possible to encounter significant differences with a level of 5%-10% for 15 cases (Annex 1). From the significative relations that are possible to evidence, the values are grouped in a range of low ($\geq \pm 0,1$) to moderate ($\leq \pm 0,8$) magnitude; for cases like food purchase decisions (TDEC) and the experience using the internet (EXP) a relation of -0,132 exists, moreover, relations between convenience (CO) and the hedonic incentives for purchasing using EC (HD) present a value of 0,612.

5. Discussion

5.1 Endogenous Variables of the Model

The consumers' motivations present direct significative effects for practically every indicative variable included in the model, apart from those associated with the time spent in order to make the decision of consumption in comparison to other commercialization channels of agri-food products such as supermarkets or farmers' market (IE2) as well as age (ED) and the preference of the person for purchasing food in supermarkets (SUPER_PREF). These results don't adjust, for the case of IE2, with the arguments raised by Teo & Yu, (2005) regarding the perception of time associated with buying online as a motivator with negative relation towards the availability of the consumer, nonetheless, it can be argued that the perception of the necessary time could remain as a value that the consumer hasn't defined with clarity in line with the devised conclusion made by (Villalobos Monge et al., 2020).

The total effect produced by the indirect mediation in some variables such as HD and CO, produce a greater impact for this second variable group, nonetheless the direct effects were greater in the first variable group. This has been presented, mentioning a couple of cases, in

other studies where the mediating effect has been measured, for example, in the case of evaluating the behavioural intentions associated with the received service by airline service clients (Chen, 2008) or the effects associated when making traveling decisions drawing from the possession of a car and the distance of the travel to be effected (Ding et al., 2017).

In the previous cases, the total effects of some observable variables were significantly increased by the indirect effect produced by the latent variable (mediating effect), similarly to what occurred for the variable "Perception on convenience of use (CO3-CO4-CO5)".

It is interesting to take into consideration the total effect of the consumers' perception on the convenience of buying food online taken as a reference if the risk of applying this purchasing channel in comparison to physical ones such as supermarkets and farmers' markets (CO6). The obtained result allows to affirm that in the presence of a diminishing level of a standard deviation on the risk perception when purchasing food using EC an increase in the average of the general response of the consumer approximately 0,5 times is predicted, maintaining on a constant manner the convenience values for CO1, CO3, CO4 and CO5.

On the other hand, the motivation associated with the direct effect that is produced on the general response, the advantages of using EC for the purchase of food (IE5) is concordant with the results of Hussain et al., (2018) regarding the stimuli that people should receive in order to increase the credibility in valuations on the experience of using products bought online. Although in said research, the indirect effects obtained from the mediation of the latent variables apparently were not evaluated, the results suggest a similar magnitude with that found by said authors ($>0,9$) for the weight of this factor.

The relations that exist between the motivations associated with convenience (CO) and the hedonic impulses (HD) favour the comprehension of what in actuality is relevant for EC sites that offer food to the consumer. The mediating effect is confirmed by the relations between the found covariances between both latent variables were an increase of one standard deviation in the perception of the consumer on HD implies an increase of approximately 0,6 times on the perception of convenience on buying food using EC and vice versa. This relation could be associated with the results shown by (Floh y Madlberger 2013) on the relation that online purchases based on hedonic impulses present. In the abovementioned research book selling sites were used, however the results obtained for this investigation show that the influence of motivations such as the consumers' satisfaction when visiting this type of EC sites (HD3) and the pleasure experienced not only by the purchased goods expose a tight relation with the claims affirmed by Floh & Madlberger (pp.3, 2013) on: "*The ambient/design characteristics of a retail environment (the stimulus) influence consumers' positive emotional responses (the organism), which in turn impact upon impulse buying (the response)*". Regarding this, the strong relation between these motivations and the general purchase response suppose a greater influence on the consumers' decision.

5.2 Exogenous Variables of the Model

Another important element is the weak influence of the exogenous variables on the general response of the consumer where the model did not evidence significative differences on the mediative effects that these produce over the indicative variables taken into consideration.

Others have found differences influenced by the effect of aspects like income or the quantity of people that compose the nuclear family (Wang et al., 2019). Nonetheless, for this study, differences for those variables were not found and a question remained to be answered in future works is if considering only one type of food, such as yogurt in the case of the research made by Wang et al (2019), will produce different results on the consumers' response modelling given that for this investigation 171 food products of five different types were considered.

Furthermore, it is relevant to check the results associated with the purchasing preference for the farmers' market channel (FERIA_PREF) as the exogenous motivation with a greater direct effect in comparison to the rest of the variables that were considered for this category.

In virtue of the results of this work a significative difference was not found for the indirect effect that could be obtained when being mediated by the latent variable "Main channel used to buy food (PREF)", by which the food purchasing channel that the consumer uses does not represent in actuality a motivation that influences on the decision of buying food online.

The abovementioned suggests that the consumer motivates his' or her food products purchases only based on the commercialization channel that he or she uses without taking into consideration other options that are presented in the market. This will be an important result to be contrasted be further investigation that take into consideration these commercialization channels, particularly since the occurrence of major changes in the economic space such as the pandemic caused by SARS-Cov-2 where, already, some works have been published regarding the evolution that EC should have in virtue of attending the consumers' necessities generated by the effects of the crisis and the possible new pandemics (O'Leary, 2020).

In this study latent variables do not show a significance lower to 5% in none of the five evaluated cases, this suggests that the person that purchases food using EC would not be seeing his/her food purchase response by this channel according to these variables.

6. Conclusions

Certain important conclusions of the investigation can be indicated that resume the fulfilment of the proposed hypothesis.

In first place, the proposed model showed that the relations between the variables corresponding to the consumers' food purchase response using EC (R) are plausible to occur based on the proposed equations for the suggested SOR model. This represents a first approximation for effects of the investigation on this topic since the literature review did not manage to find any evidence of this.

In second place, the utilitarian motivations, particularly those associated with the perception on ease of using (and of learning how to use) this purchase channel, demonstrates the greater total effect that influences the consumers' response. This suggests that EC food consumers find in these types of stimuli the main motivator when making the decision to buy food online even though it must be cleared that the hedonic motivations are found to be very similar in their relevance, particularly by the pleasure that motivates the consumer to make the purchase of foods using this channel. In future investigations this matter should be put into account in order to contrast that this conclusion maintains its validity through time.

In third place, it was possible to prove that the proposed hypothesis on the better explaining of the purchase of food using EC through endogenous variables in comparison to sociodemographic characteristics (exogenous variables) is true. As a result, it is assumed that SEM models allow to verify a hypothesis which complexity could compromise the interpretation of the results under other methodological approximations.

It is also necessary to stand out that the socioeconomic motivations (exogenous for the case of the applied model in this work) did not represent an important motivation to explain the EC food consumers' response. This didn't occur in other works where purchase motivations were also studied (Grunert et al., 2014; Ragaert et al., 2004), where one of the particular differences with our investigation was the purchasing channel (physical medium) that the consulted consumers used.

As a result, this suggests that in EC the socioeconomic characteristics, differently from physical mediums, could not present relevant factors in the moment of making the food purchase decision. Nevertheless, this conclusion will result as convenient to validate in future work as well as the precision of this hypothesis.

Finally, it can be concluded that the identification, prioritization, and analysis of the effectuated motivations in this work generate a referential framework for future investigations on EC and food purchase intentions topics. This is relevant because of the contribution to agri-food science in the sense of the information *per se* adding to the proposition of a first model that approximates this purchase intentions.

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Footnotes:

1/ Exchange rate average (feb-nov 2019): 1 USD= 590 CRC

2/ Website of Agroferia of the University of Costa Rica:<https://agroferia.ucr.ac.cr>.

Annex1. Existent covariances between the latent variables of the S-O-R model employed with the consumers' motivations at the moment of purchasing food through virtual channels.

Latent variable	Estimate	Standard error	z-value	P(> z)	Standardized latent variable	Standardized all
SES ~~						
HCONS	-0.253	0.350	-0.723	0.470	-0.253	-0.253
TDEC	-0.054	0.154	-0.351	0.726	-0.054	-0.054
PREF	-0.010	0.146	-0.071	0.943	-0.010	-0.010
EXP	-0.109	0.131	-0.829	0.407	-0.109	-0.109
CF	-0.245	0.162	-1.516	0.129	-0.245	-0.245
CO	0.294	0.139	2.111	0.035	0.294	0.294
IE	0.510	0.167	3.046	0.002	0.510	0.510
HD	-0.092	0.137	-0.667	0.505	-0.092	-0.092
HCONS ~~						
TDEC	-0.071	0.177	-0.401	0.688	-0.071	-0.071
PREF	-0.162	0.180	-0.900	0.368	-0.162	-0.162
EXP	0.052	0.175	0.299	0.765	0.052	0.052
CF	0.431	0.211	2.042	0.041	0.431	0.431
CO	0.129	0.197	0.656	0.512	0.129	0.129
IE	-0.165	0.210	-0.786	0.432	-0.165	-0.165
HD	0.277	0.191	1.454	0.146	0.277	0.277
TDEC ~~						
PREF	-0.012	0.085	-0.136	0.892	-0.012	-0.012
EXP	-0.132	0.059	-2.244	0.025	-0.132	-0.132
CF	0.039	0.100	0.387	0.698	0.039	0.039
CO	0.176	0.077	2.276	0.023	0.176	0.176
IE	0.146	0.093	1.567	0.117	0.146	0.146
HD	-0.144	0.083	-1.725	0.085	-0.144	-0.144
PREF ~~						
EXP	0.235	0.084	2.785	0.005	0.235	0.235
CF	-0.052	0.098	-0.531	0.595	-0.052	-0.052
CO	-0.214	0.108	-1.970	0.049	-0.214	-0.214
IE	-0.005	0.097	-0.049	0.961	-0.005	-0.005
HD	-0.056	0.089	-0.630	0.528	-0.056	-0.056
EXP ~~						
CF	-0.028	0.092	-0.303	0.762	-0.028	-0.028
CO	-0.176	0.084	-2.087	0.037	-0.176	-0.176
IE	-0.245	0.065	-3.790	0.000	-0.245	-0.245
HD	0.024	0.074	0.319	0.750	0.024	0.024
CF ~~						
CO	0.459	0.116	3.969	0.000	0.459	0.459
IE	0.220	0.112	1.955	0.051	0.220	0.220
HD	0.482	0.084	5.709	0.000	0.482	0.482
CO ~~						
IE	0.589	0.094	6.237	0.000	0.589	0.589
HD	0.612	0.073	8.411	0.000	0.612	0.612
IE ~~						
HD	0.151	0.116	1.305	0.192	0.151	0.151