

Sustainability or Health: Why Brazilian Consumers Buy Organic Food?

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Abstract

This research investigated environmental awareness aspects and the behaviour involving search for health in an attempt to find their influence on consumers' intention to purchase organic food (OF), namely organic fruits and greens (OFGs), in Fortaleza, a Brazilian Northeastern metropolis. The quantitative analysis herein presented is based on a sample survey which involved 200 organic food consumers. The data was submitted to Structural Equation Modelling (SEM) in the light of the Theory of Planned Behaviour. A general OF buyer sample led to the conclusion that purchase behaviour is influenced by factors related to beliefs concerning search for health, not to environmental awareness. It also bring to light an important issue regarding the profile of organic food buyers in Brazil revealing the link to health issues which might be explored by marketing actions, they also indicate the need for more discussion with general public about environmental impacts caused by food production.

Keywords: Organic Food, fruits and greens; Brazil; Purchase intention; Health; Environmental concern.

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Introduction

The global market for organic food (OF) has been growing since the middle of the 1990s. A specific part of this market, comprised by non-processed fruits, vegetables and greens (OFG), represents about 45% of sales (Winter & Davis, 2006). The world market revenue for certified OFGs was estimated at USD 59.1

billion in 2010 (Willer & Kilcher, 2012). According to the 2015's report of Research and Markets, the global market continues to grow at a rate of 9.4% in 2015 with an increasing OFG consumption, being expected to reach about USD 63 billion by 2020. One of the main points of this projection is the role of emerging markets, such as India, China and Brazil (Global Organic Trade, 2015).

Some authors observed that the food supply crisis and growing concerns over the use of pesticides in agriculture have started to shake consumers' beliefs in processed food, resulting in a demand for healthier options (Portilho, Castaneda & Castro, 2011; Shaharudin; Mansor & Elias, 2010; and Chen, 2007). On the other hand, the institutionalized concept of Organic Food brings a common assertion about its production. Thus, organic agriculture is believed to use organic rather than synthetic fertilizers, avoiding pesticides and other agrochemicals, also antibiotics and hormones, as in animal husbandry. It may be defined as an ecological production and management system, favouring biodiversity, biological cycles and biological soil activity (Winter & Davis, 2006; Schafer et al., 2009; Paul & Rana, 2012, Beharrell & MacFie, 1991). Therefore, the organic food consumption growth could be understood as both healthy and ecologically friendly. In the market perspective, since the 1990s, it has become relevant to investigate these consumers' profiles, their values, beliefs and attitudes in relation to intention and behaviour (Werner & Alvensleben, 1984; Beharrell & MacFie, 1991; Davies et al., 1995; Schifferstein & Oude Ophuis, 1998; Zanolli & Naspetti, 2002; Chen, 2007 & 2009).

According to Magnusson *et al.* (2003), the association of organic foods with health and environment allows the identification of two consumer profiles. The egoistic profile is based on personal health as the main motivation factor, whereas the altruist is focused on environmental preservation and food supply for future generations (Magnusson *et al.*, 2003). Therefore, the growing interest in OF may be associated with both altruism and egoism factors. On the one hand, there are ethical concerns over environmentally friendly production methods (including the well-being of the workers involved); on the other hand, consumer health is focused to the detriment of the environmental perspective (Gil; Gracia; Sanchez, 2000; Baker *et al.*, 2004; Özcelik & Uçar, 2008, Cerjak et al. 2010). Guillon and Willequet (2003), as well as Guivant (2003), polarize the issue by stating that consumers seeking health, self-confidence, and cosmetic benefits are on an "ego trip", whereas consumers systematically purchasing OFG in support of a social environmental agenda are on an "eco trip". Nevertheless, this research does not aim to identify profiles, remaining this issue as research background.

The consumers' OF profile, mostly based on demography, lifestyle and purchase behaviour, has been the object of studies in European countries since the last decades of the twentieth century, as mentioned by Baker et al. (2004) (see also Schifferstein & Oude Ophius, 1998; Gil Garcia & Sanchez, 2000; Tsakiridou et al., 2008; Essoussi & Zahaf, 2009).

Besides the consumer profile, other studies sought to understand the motivations to the organic food purchase. Most of them used a chain construct of a rational action, which is derived from the Theory of Rational Action (TRA) and its improved version, the Theory of Planned Behaviour (TPB), proposed by Ajzen (1991). In doing so, they tried to measure values, beliefs, attitude, intention, and a final behaviour (purchase).

TPB has previously been used in studies on organic food consumption to verify the existence of possible positive associations between perceived behavioural control, the intention to buy, and the actual purchase

of such foods (Chen, 2007; Thøgersen, 2006, Aertsens et al, 2009;). The cognitive and affective components which influence the intention to buy OF should, therefore, be taken into account when investigating consumer behaviour (Dean; Raats & Shepherd, 2008).

Brazilian authors have also employed TPB, but very few have applied it to the investigation of OF consumption. For example, Santos, Veiga and Moura (2010) applied TPB to the field of technological services. Hoppe et al. (2012) surveyed the profile of organic food consumers at ecological fairs and supermarkets, partly replicating the methodology adopted in the EU-funded CONDOR project (Consumer Decision Making on Organic Products) in which TPB and Personal Value Theory were used to explore the values, attitudes and affective components believed to determine organic food consumer behaviours. Rodrigues, Carlos, Mendonça and Correa (2009), in light of TPB, surveyed supermarket customers in Ribeirão Preto, a Brazilian South-east town, and found that the decision to buy OFGs was mainly the result of egoistic factors.

Hitherto, studies have found a range of motivations to the organic food purchase. Besides being healthier and environmentally friendly, it tastes better, is made of natural content only (without genetic modified substances, chemicals or hormones), and uses local content (Lockie et al., 2002; Cerjak et al., 2010; Chen, 2007 & 2009; Hughner et al., 2007; Tsakiridou et al., 2008; Aertsens et al., 2011; Nasir & Karakaya, 2014; Nedra et al., 2015).

Nevertheless, most of the international published researches about purchasing are from markets in developed, industrialized countries (Schifferstein & Oude Ophuis, 1998; Baker et al., 2004; Tarkiainen & Sundqvist, 2005; Onyango et al., 2007; Essoussi & Zahaf, 2009; Aertsens et al., 2009; Shafie & Rennie, 2012). There are some studies in developing countries (Paul & Rana, 2012; Hoppe et al., 2013; Nedra et al., 2015; Xie et al., 2015 Yazdanpanah & Forouzani, 2015; Thøgersen et al., 2015), but despite them, this research field still has a gap in the understanding of the rationality chain from the motivation to the purchase behaviour in these regions.

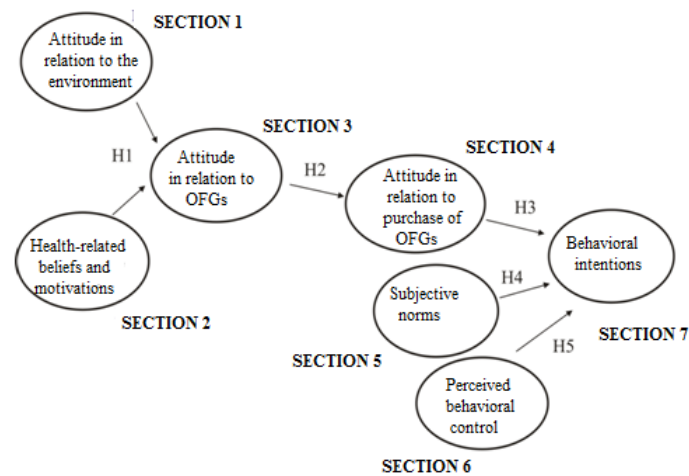
This study followed the research design of Chen (2007) in order to understand this purchase rational chain by means of constructs, such as attitudes, intentions, and behaviours. It presents the two main attitudinal motivations in the literature, namely health beliefs and ecological awareness, which could compose the attitudes towards organic food, conducting the investigation in the light of the Theory of Planned Behaviour (Ajzen, 1991 & 2001; Ajzen & Fishbein, 2008). Despite the criticism about the behaviour rationality in the TPB, this theory has been used in other studies concerning this theme (Chen, 2007; Dean et al., 2008; Hoppe et al., 2012; Nasir & Karakaya, 2014; Lee & Yun, 2015; Hsu et al., 2016). Thus, it was considered a valuable approach for the purposes established herein.

The purpose of the present study was to understand the consumers' purchase behaviour in Fortaleza, a Brazilian metropolis in the Northeast Brazil, featuring elements which characterize it as an underdeveloped region of a developing country. Such understanding was sought by means of a rational chain, starting from the beliefs in environmental awareness and healthy lifestyle, the two main motivations according to international researches.

Based on a study by Chen (2007), and in view of the aforementioned considerations regarding food consumer profiles and TPB, it was decided to investigate the relation between health and environment

constructs and OF consumption. Figure 1 shows the conceptual framework adopted in the present study and the relations between the constructs.

Figure 1: Conceptual framework and the proposed relations among TPB constructs.



Source: the authors based on a study by Chen 2007]

The following hypotheses were formulated:

H1a: Attitude towards the environment (ATEN) is related to attitudes towards organic food (ATOF);

H1b: Health-related beliefs (HRBM) are related to attitudes towards organic food (ATOF);

H2: Attitude towards organic food (ATOF) is related to attitudes towards the purchase of organic food (ATPU);

H3: Attitudes towards the purchase of organic food (ATPU) influence the behaviour/purchase intention towards organic food (BINT).

H4: Subjective norms (SNRM) influence behaviour/purchase intention towards organic food (BINT);

H5: Perceived behavioural control (PCTR) influences behaviour/purchase intention towards organic food (BINT).

After this introduction follow the sections presenting methods, calculation, results and discussion. In the end, conclusions are presented, as well as final considerations regarding the academic and managerial implications of the study.

2. Material and methods

The first definition of the research design led to the choice of a specific kind of organic food. In order to better identify the consumer that was purchasing OF at the retail site, it was decided to study the purchase of Organic Fruits and Greens. The OFGs used to be quoted in the literature as a more explicit organic food (Winter & Davis, 2006; Dean et al., 2008; Thøgersen et al., 2015), and represent about 45% of the total OF market (Willer & Kilcher, 2012). Moreover, the OFG purchase is a final behaviour confirmed by the prior identification of the respondent.

Based on questionnaires previously used in similar studies, the instrument of this study comprised nine sections, seven of them designed directly aligned to the TPB. The eighth and ninth sections collected

information on purchase frequency and socio-demographic profile, respectively. Most of the questionnaire items were scored on a seven-point Likert scale. Table 1 shows the construct/parameter evaluated in each section.

Table 1: Overview of the nine sections in the questionnaire.

Section	Construct/parameter	Code	Number of questions	Reference	Objective
1	Beliefs & Attitude in relation to the environment	ATEN	05	Gil; Gracia; Sanchez (2000)	To measure beliefs and attitudes in relation to the construct “environmental awareness”
2	Health-related beliefs and motivations	HRBM	09	Chen (2007); Schifferstein & Oude Ophuis (1998)	To measure beliefs and attitudes in relation to the construct “health seeking behaviour”
3	Attitude in relation to OFGs	ATOF	09	Gil; Gracia; Sanchez (2000)	To measure beliefs and attitudes in relation to the construct “organic foods”
4	Attitude in relation to purchase of OFGs	ATPU	06	Hoppe et al, (2010)	To measure beliefs, attitudes and moral judgments in relation to the construct “purchase of OFGs”
5	Subjective norms	SNRM	02	Chen (2007)	To measure the social factors influencing intentions.
6	Perceived behavioural control	PCTR	03		To measure predictors of actual control and perceived barriers.
7	Behavioural intentions	BINT	02	Shaharudin <i>et al</i> (2010)	To measure behavioural expectations of respondents in relation to purchase.
8	OFG purchase frequency	-	04	The authors	To quantify purchase frequency
9	Socio-demographic profile	-	07	The authors	To draw a consumer profile.

Source: the authors.

The questionnaire was applied to a pilot sample of about 30 scholars from the Federal University of Ceará, from different areas (Engineering, Social Sciences, etc.). The initial question, which investigated the actual OFG purchase, was reinforced. The high education level of this sample might suggest some bias, but it confirmed the fitting of the questionnaire. The pre-test contributed to the research, among other advantages, to determine how long the respondents would need to take to complete the survey (Hair Jr et al., 2010), and to verify the proper comprehension of the questions (Malhotra, 2012). In order to facilitate

the survey process, each question block (representing a scale) was presented separately to the respondents right in the pre-test phase. The average response time in this pre-test stage was 10 minutes per respondent. In order to run the sample, it was hired a market research group which had to perform 200 valid questionnaires. One of the authors supervised the field researchers daily. Therefore, the questionnaire was administered to 200 customers at two types of OFG retail sites in Fortaleza, involving 16 supermarkets (previously authorized) and an agro-ecological fair (at the time, the only one in the city). Even after a visual identification of the OFG purchase, the respondents were screened with a filter question confirming that they purchased OFG.

TPB assumes that behaviours may be predicted, albeit imperfectly, based on a combination of attitudes, subjective norms and perceived behavioural control. The combination of study constructs allowed a meaningful interpretation of the data. Thus, Structural Equation Modelling (SEM) was chosen to analyse the multiple relationships between the dependent and independent variables of the conceptual framework. For this purpose, the questionnaire data were submitted to multivariate statistical analysis, using the software SPSS and AMOS, v. 20.0.

3. Theory and Calculation

SEM is a multivariate analysis technique which combines aspects of multiple regression (evaluating dependent relationships) and factor analysis in order to simultaneously estimate series of dependent relationships (Hair et al, 2005). The expression “structural equation” derives from relationship models between independent and dependent latent variables (Lattin; Carro & Green, 2011).

In SEM, the evaluation of the proposed model requires fitting the study parameters and the model in general. Table 2 shows three types of fitting reference values to different indexes: i) absolute fit indexes, indicating the general fit of the model, ii) comparative fit indexes, in which the fit is verified by comparing the chosen model to a more restrictive one (basic or null model), and iii) parsimonious fit indexes, determining the number of study parameters required to attain a particular level of fit while avoiding over-fitting model (Hair Jr et al., 2005).

Table 2: Model fit indices

Type	Index	Reference values	
Absolute fit measures	CMIM (Chi-square)	Not defined	
	Degrees of freedom (DF)	≥ 1	
	CMIN/DF (χ^2/GL)	<5	
	Goodness-of-Fit Index (GFI)	>0.90	
	Adjusted Goodness-of-Fit Index (AGFI)	>0.80	
Comparative (incremental) fit measures	Comparative Fit Index (CFI)	0.90	
	Normed Fit Index (NFI)	>0.90	
	Tucker Lewis Index (TLI)	>0.90	
Parsimonious fit measures	Root Mean Square Error of Approximation (RMSEA)	Good fit	Acceptable fit
		0.00 < RMSEA < 0.05	0.05 < RMSEA < 0.08

Source: the authors, based on Silva (2006), Hoppe et al.(2010) and Hair Jr et al.(2005).

It is assumed that the quality of the results produced from a structural equation model depends on the quality of the preliminary model fit in relation to the data set. The overall model fit is tested by a set of indices (including RMSEA and AGFI) rather than by a single best index; in other words, a combination of indices should be used (Silva, 2006; Hair Jr *et al*, 2005). In addition to the analysis of these indices, the reliability and the variance extracted from each construct were determined in order to accurately assess the one-dimensional and convergent validity of the model.

4. Results

4.1. Socio-demographic description of the study sample

Women were predominant in the sample, corresponding to 136 respondents (68%), whereas men were in number of 64 (32%). When the sample was stratified by age group, the first three groups were almost equally represented: 18-25 years (18%), 26-35 years (19%) and 36-45 years (18.5%). The fourth group (46-55 years) was the largest (n=52; 26%). The fifth group (56-65 years) and the sixth group (>65 years) were represented by 27 (13.5%) and 10 (5%) consumers. Most respondents claimed to have college degree.

Family income also varied in the sample. Five income groups were considered: BRL \leq 1,000 (approx. USD \leq 400), BRL 1,001 - 3,000 (approx. USD 400 - 1,200), BRL 3,001 - 5,000 (approx. USD 1,200 - 2,000), BRL 5,001 - 7,000 (approx. USD 2,000 - 2,900), and >BRL 7,000 (approx. USD 2,900). The third income group (BRL 3,001 - 5,000) was predominant in the sample (29%), followed by the last group (25.5%), the second group (17%), the fourth group (15.5%), and the first group (13%).

Regarding the type of retail site, more respondents were interviewed at supermarkets (87.5%) than at the agro-ecological fair.

4.2 Descriptive analysis of TPB constructs

Table 3 shows the constructs analysed in the study and their respective observable indicators, mean values, and standard deviations. The highest mean values were found to the following indicators: "It is important that my daily diet keeps me healthy" (6.70) and "I think it is important to know how to eat in a healthy way" (6.67), both related to the construct HRBM. As for the construct ATEN, the highest mean values were found to the following indicators: "Development is destroying the environment" (6.25) and "Unless something is done, environmental damage will be irreversible" (6.38).

There was considerable agreement among the respondents regarding the statement that OFGs are healthy, as shown by the average scores obtained to *atof1* (6.63) and *atof2* (6.34).

Table 3: Descriptive statistics of TPB constructs and their respective indicators.

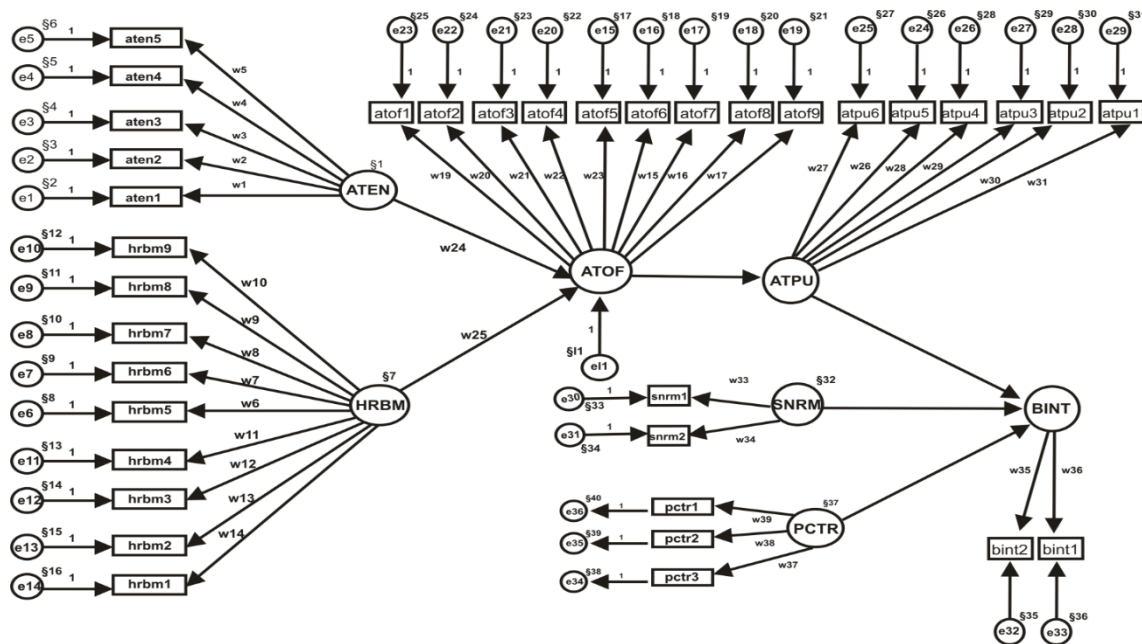
Construct	Observable indicators (code)	Mean	S.D.
ATEN	Development is destroying the environment (aten1)	6.25	1.34
	I prefer to buy recycled products (aten2)	5.12	1.75
	I sort my waste (aten3)	4.75	2.25
	Unless something is done, environmental damage will be irreversible (aten4)	6.38	1.35
	I actively help preserve the environment (aten5)	5.26	1.63
HRBM	It is important that my daily diet keep me healthy (hrbm1)	6.70	0.81
	I do not think all the time whether everything I do is healthy (hrbm2)	4.57	2.05
	It is important that my daily food be nutritious (hrbm3)	6.48	1.12
	It is important that my daily food benefit my skin, teeth and hair (hrbm4)	6.24	1.33
	I think it is important to know how to eat in a healthy way (hrbm5)	6.67	0.74
	I have the impression other people are more health-aware than me (hrbm6)	3.88	2.18
	I do not wonder all the time whether the food I eat is good for me (hrbm7)	4.22	2.10
	I think I sacrifice a lot for the sake of my health (hrbm8)	3.27	1.90
	I am willing to abstain from a lot of foods and eat in the healthiest possible way (hrbm9)	5.38	1.72
ATOF	Organic foods are healthier (atof1)	6.63	0.85
	Organic foods are of better quality (atof2)	6.34	1.11
	Organic foods are a hoax (atof3)	1.84	1.38
	Organic foods are tastier (atof4)	5.11	1.91
	Organic foods are worse than non-organic foods (atof5)	1.80	1.51
	Organic foods are more expensive (atof6)	6.50	1.12
	Organic foods look more attractive (atof7)	5.17	2.01
	Organic foods cause no harm (atof8)	5.59	1.76
	Organic foods are a fad (atof9)	2.04	1.54
ATPU	Buying OFGs rather than non-organic foods makes me feel “politically correct” (atpu1)	5.72	1.76
	Buying OFGs rather than non-organic foods makes me feel a better person (atpu2)	5.32	2.04
	Buying OFGs rather than non-organic foods makes me feel I am making an important contribution (atpu3)	6.03	1.46
	Buying OFGs rather than non-organic foods would be... (atpu4)	6.57	0.90
	Buying OFGs rather than non-organic foods would be... (atpu5)	6.50	0.93
	Buying OFGs rather than non-organic foods would make me feel... (atpu6)	6.41	1.09
SNRM	Most of the people who are important to me think I should _____ OFGs (snrm1)	5.67	1.70
	Many of the people close to me think I should _____ OFGs (snrm2)	5.66	1.62
PCTR	If OFGs were sold at the stores, nothing would prevent me from buying them if I felt like it (pctr1)	5.85	1.46
	I have control over occasional purchases of OFGs (pctr2)	5.45	2.02
	If I wanted to, I could easily buy OFGs instead of non-organic foods (pctr3)	5.03	2.09
BINT	I plan to buy OFGs sometime soon (bint1)	6.14	1.23
	I plan to buy OFGs within the next two weeks (bint2)	5.64	1.83

Source: Data collected for the study in 7 points Likert scales

4.3 Fitting of the proposed model

The conceptual framework shown in Figure 1 was expressed in the form of a path diagram and named “Model 1” (Figure 2). According to Hair Jr *et al.* (2005), a path diagram is not only a visual description of predictive relations between constructs (relations between dependent and independent variables), but also of associative relations (correlations) between constructs or even indicators.

Figure 2: Model 1. Path diagram of the conceptual framework (from AMOS).



Source: The authors. The indices based on Model 1 (Figure 2) are listed in Table 4.

As shown in the diagram, the constructs ATEN (attitude in relation to the environment), HRBM (health-related beliefs and motivations), SNRM (subjective norms) and PCTR (perceived behavioural control) are exogenous, while ATOF (attitude in relation to OFGs) and ATPU (attitude in relation to purchase of OFGs) are endogenous. The indexes based on Model 1 (Figure 2) are listed in Table 4.

Table 4: Model fit indices for Model 1.

Index	CMIN/DF	RMSEA	PCLOSE	GFI	AGFI	CFI	TLI	NFI	P
Reference	< 5	0.05-0.08	>0.05	>0.90	>0.80	>0.80	>0.90	>0.90	0.05-0.10
Study	1.91	0.08	0.00	0.76	0.72	0.74	0.72	0.59	0.00

Source: Data collected for the study

The combination of test indexes used to fit the sample proposed model yielded poor results. To improve the fitting, therefore, the model was redesigned in an attempt to find robust significant correlations.

4.4 A fitting Model

In the second model, some of the constructs were correlated at the 5% level of significance ($p < 0.05$). Not all estimates (ATEN, SNRM and PCTR) were significant because their C.R. values did not fit the desired parameter ($> |1.96|$), indicating that the hypotheses regarding these constructs should be rejected.

Furthermore, in the redesigned model, ATEN not only did not have any positive influence on ATOF, but in fact had a negative weight, a finding which justifies rejecting the H1a. Likewise, SNRM and PCTR failed to significantly impact the intention related to OFG purchase. Thus, H4 and H5 were also rejected.

The constructs ATEN, SNRM and PCTR were subsequently removed from the model. The fit of the final model was good, as shown in Figure 3. This was the best model of the conceptual framework based on TPB.

Figure 3: Model 2. Path diagram of the conceptual framework.

Source: Data collected for the study.

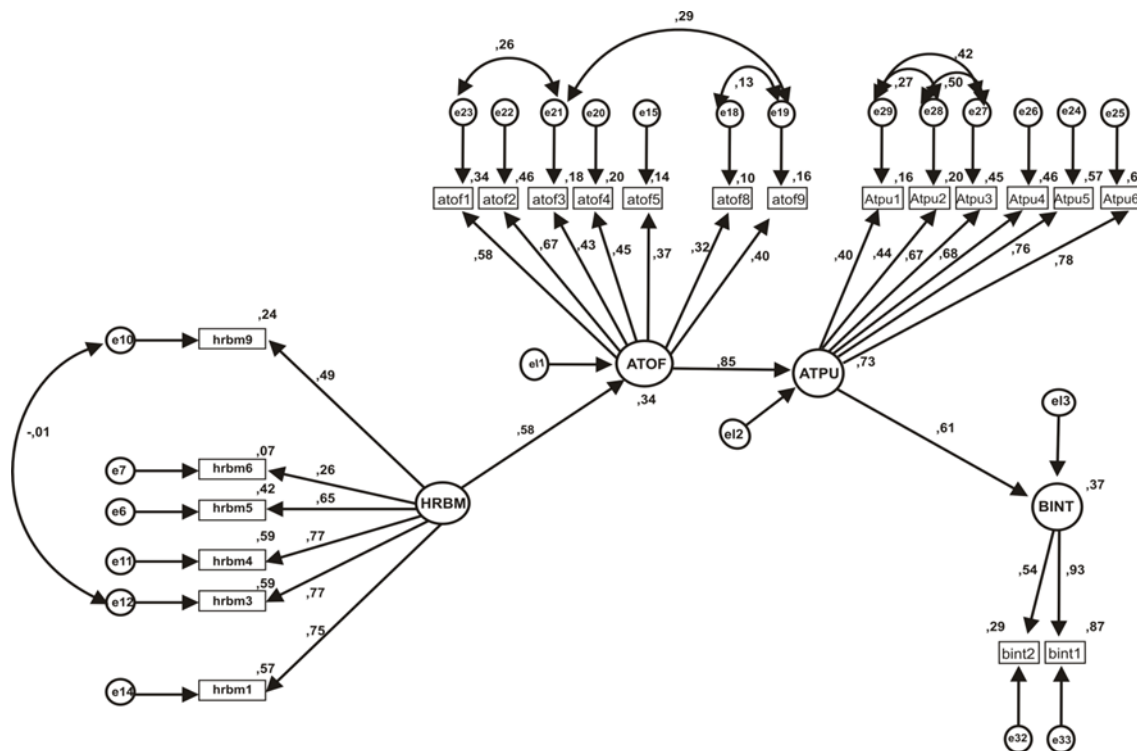


Table 5 shows the model fit for the final model.

Table 5: Model fit indices for the final model.

Index	CMIN/DF	RMSEA	PCLOSE	GFI	AGFI	CFI	TLI	NFI	P
Reference	< 5	0.05-0.08	>0.05	>0.90	>0.80	>0.80	>0.90	>0.90	0.05-0.10
Study	1.77	0.06	0.04	0.87	0.83	0.89	0.88	0.79	0.00

Source: Data collected for the study.

Regarding the absolute fit measures, the value of GFI (0.87) was fitted to the recommended standards. RMSEA was fitted to the desired parameters (1.77), indicating that the constructs were appropriately fitted to the study population. The incremental fit measures (NFI, CFI and TLI) used to compare the final model

to the null model were also slightly fitted. The ratio between χ^2 and degrees of freedom, which should be under 5, was appropriately fitted (1.76).

The diagram of the final model shows that ATOF exerts a strong and direct influence (0.85) on ATPU. HRBM produces a smaller but relevant impact (0.58) on ATOF. In the study sample, ATPU had a positive and slightly stronger influence (0.61) on buying intention. The analysis of the estimates for the parameters, including the regression weights of the final model, is presented in Table 6.

Table 6: Regression weights standardized for the final model

		Construct	Estimates	Standardized estimates	S.E.	C.R.	P
ATOF	<---	HRBM	.333	0.584	.059	5.647	***
ATPU	<---	ATOF	1.219	0.853	.188	6.483	***
BINT	<---	ATPU	.999	0.612	.137	7.273	***
hrbm5	<---	HRBM	.553	0.647	.065	8.516	***
hrbm6_mod	<---	HRBM	.649	0.256	.193	3.355	***
hrbm9	<---	HRBM	.977	0.489	.151	6.455	***
hrbm4	<---	HRBM	1.190	0.769	.115	10.369	***
hrbm3	<---	HRBM	1.000	0.769			
hrbm1	<---	HRBM	.711	0.753	.070	10.138	***
atof8	<---	ATOF	1.144	0.320	.304	3.759	***
atof9_mod	<---	ATOF	1.256	0.400	.273	4.596	***
atof4	<---	ATOF	1.743	0.449	.350	4.985	***
atof5_mod	<---	ATOF	1.139	0.372	.268	4.252	***
atpu5	<---	ATPU	1.000	0.756			
atpu6	<---	ATPU	1.205	0.777	.120	10.050	***
atpu4	<---	ATPU	.872	0.682	.095	9.211	***
atpu3	<---	ATPU	1.405	0.674	.150	9.340	***
atpu2	<---	ATPU	1.289	0.445	.219	5.877	***
atpu1	<---	ATPU	.994	0.398	.188	5.287	***
bint2	<---	BINT	.869	0.543	.174	4.980	***
bint1	<---	BINT	1.000	0.933			
atof_3_mod	<---	ATOF	1.194	0.427	.214	5.577	***
atof1	<---	ATOF	1.000	0.580			
atof2	<---	ATOF	1.517	0.675	.215	7.044	***

Source: Data collected for the study. *** $p < 0.001$ (significant)

In Table 6, the P values are significant for all constructs since the C.R. values are well above the reference value ($>|1.96|$). Thus, the final model was fitted with different index combinations. It should be added that the study findings indicate a correlation between several pairs of indicators in the general model (such as

atof1/atof3, atof3/atof9, atof8/atof9, atpu1/atpu2, atpu2/atpu3, and atpu1/atpu3). Thus, the addition of covariance between the errors of these two indicators would lead to a significant improvement. The insertion of such covariance significantly improved the fit of the final model and the fit indexes, as shown in Table 5 comparing to Table 4. In other words, based on the final fitted model (Figure 3), some of the study hypotheses were rejected while others were accepted (Table 7).

Table 7: Study hypotheses and results.

Hypothesis	Relation	Standardized factor load	T-value	Result
H1a: Environmental awareness influence attitudes in relation to OFGs.	ATEN/ATOF	-	-	Rejected
H1b: A “health seeking” behaviour influences attitudes in relation to OFGs.	HRBM/ATOF	0.584	(5.647)	Accepted
H2: Attitudes in relation to OFGs influence attitudes in relation to the purchase of OFGs.	ATOF/ATPU	0.853	(6.483)	Accepted
H3: Attitudes in relation to the purchase of OFGs influence consumers’ intention to buy OFGs.	ATPU/BINT	0.612	(7.273)	Accepted
H4: Subjective norms influence consumers’ intention to buy OFGs.	SNRM/BINT	-	-	Rejected
H5: Perceived behavioural control influences consumers’ intention to buy OFGs.	PCTR/BINT	-	-	Rejected

Source: Data collected for the study.

T-values >|1.96| are significant ($p < 0.05$)

Discriminating validity analysis was used mostly to confirm the validity of constructs involving the comparison of correlations between the constructs of the model and a theoretical model. Table 8 shows the results.

Table 8: Discriminating validity of the constructs.

Relation	Difference in χ^2	Difference in GL	P-value
HRBM/ATOF	46.373	1	0.000
ATOF/ATPU	42.72	1	0.000
ATPU/BINT	30.123	1	0.000

Source: Data collected for the study

Differences between χ^2 values of more than 3.84 were statistically significant (Lattin; Carrol; Green, 2011). Therefore, discriminating validity was confirmed for the final model.

5. Discussion

Our results reveal particularities of the local market, a metropolis in an underdeveloped region of an emerging country. Some of the original variables included in the questionnaire had to be removed in order to fit the proposed framework to the indicators required for the validation of a fitting model.

The original conceptual framework suggested a causal chain to the purchase behaviour related to: a) aspects of individual concerns, materialized in the construct HRBM (health-related beliefs and motivations) and b) environmental awareness *a priori* directly linked to organic foods, materialized in the construct ATEN (attitude in relation to the environment).

The first study hypothesis (H1a), which expressed a relationship between OF consumption and environmental awareness, was rejected. Nevertheless, most studies pointed the environmental concern as a second motivation to OF purchase. The results in the present study are aligned with other works that deny this connection, such as the initial studies of Davies et al. (1995), which found discrepant UK profiles related to people's concern regarding health and environment, confirming results of Lockie et al. (2002), who did not find environmental awareness as an independent purchase motivation. Similar results were attained by Yadav & Pathak (2016). These authors recently found that "environmental concern did not show any significant influence on purchase intention of organic food" in their developing country, India. It is relevant to consider that the low environmental awareness perception could likely be a delayed environmental concern in the developing countries, which might suggest that such result is aligned with those found more than a decade ago in the developed countries.

On the other hand, the OF motivation based on health-related factors (H1b) has been confirmed by this study, a finding supported by most of the studies reviewed (and specifically Cerjak et al. 2010 in Croatia and Slovenia and Chen, 2009), also in line with the following statement of Lockie et al. (2002:38): "A more reasonable conclusion is that among the plethora of competing demands and motivations faced by organic consumers, including a genuinely strong environmental commitment, the concern least likely to be compromised is that of personal and family health".

Following the chain analysis proposed by TPB, the construct ATOF (attitude in relation to OFGs) strongly influenced the construct ATPU (attitude in relation to OFG purchase), validating H2.

The hypothesis H3 assumed that ATPU (attitude in relation to purchasing of OFGs) exerted a positive influence on the intention to purchase the OFGs. The final model confirmed this influence, validating H3. The validation of H2 and H3 finalises the chain approach, linking beliefs and attitude to the purchasing action.

Finally, H4 and H5 were rejected as the fitting of the model, since SNRM (subjective norms) and PCTR (perceived behavioural control) had no measurable impact on the intention to purchase OFGs. These last two hypothesis rejections, despite possible practical consequences, are very interesting to the theoretical discussion on TPB, for the discussions on subjective norms and perceived behavioural control were the surplus of the TPB in relation to TRA. Therefore, these results align with other studies that do not use the TPB, but the original TRA (Tarkiainen & Sundqvist, 2005; Nasir und Karakaya, 2014; Nedra et al., 2015; Lee & Yun, 2015). They are also in accordance with the results from Yazdanpanah & Forouzani

(2015), who, after testing TPB, found that norms and behaviour control do not fit in the model either, the same as the studies of Yadav & Pathak (2016), in which norms also failed to explain the behaviour.

6. Conclusions

This study investigated the influence of aspects of environmental awareness and health seeking behaviours on consumers' intention to purchase organic fruits and greens (OFGs) in supermarkets and an agro-ecological fair in Fortaleza, North-east Brazil. For this purpose, it was proposed the use of the Theory of Planned Behaviour (TPB) as a conceptual framework, and structural equation modelling as the main statistical technique.

The socio-demographic data presented the female gender as predominant in the study sample. Most respondents had a college degree, and many had a post-graduate degree. Most of them reported a monthly family income over BRL 3,000 (approx. USD >1,200). Supermarkets were the most important OFG outlets.

In general, respondents perceived OFGs as healthier and better than their non-organic equivalents. The vast majority disagreed with the statement that OFGs are a hoax, or worse than non-organic foods, and agreed with the statement that they are more expensive than their non-organic equivalents. The findings described herein show that the constructs "Subjective norms" and "Perceived behavioural control" are not significant factors in the local context; thus, the existence of barriers to the purchase of OFGs does not necessarily imply that OFGs are not purchased and, vice-versa, ease of purchase does not mean OFGs are in fact purchased. Likewise, OFG consumption did not appear to depend on external social influences such as the opinion of close kin or significant others.

Hypotheses regarding the relations between OFG consumption and the constructs "environmental awareness" and "health" were formulated in light of TPB. The study analysis of the final model (which contemplated all such relations and associations) revealed that consumers' attitudes towards OFGs were impacted by health, well-being, beauty and quality of life-related aspects, but not by environmental awareness. These findings match the results of several other studies showing that consumers are primarily motivated by egoistic factors. Thus, the study question concerning environmental awareness and health seeking behaviours (including well-being, beauty, and quality of life) and their direct influence on consumers' intention to purchase OFGs may find a negative answer regarding environmental awareness, whereas affirmative in relation to health seeking.

The study presented some limitations. For instance, the questionnaire used to collect information was compiled from different works/sources. Most of the studies reviewed in this investigation used questionnaires adjusted to cultural contexts. Consequently, although prudently pre-testing the questionnaire, differences in context may have rendered some of the items in the study questionnaire less relevant or appropriate. In addition, due to limitations of time and resources, the respondent sample was restricted to the minimum size required for meaningful statistical analysis and consistent results.

The present investigation has potential academic and managerial implications. Regarding the former, i) it was conducted an empirical test of a well-established theoretical framework widely used to study consumers' behaviour, ii) it was employed structural equation modelling for the analysis, an

increasingly popular technique, which has been the object of much discussion worldwide due to its complexity, and iii) it was investigated the profile of a relatively unexplored consumer population. As to the managerial aspect, there is a contribution to the current knowledge of the factors determining the behaviour of a consumer population, which is expected to expand considerably in the near future. It is hoped that these findings will assist production and supply chain managers in the development and implementation of OFG marketing strategies.

7. References

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