



Consumers' Expectations on Transparency of Sustainable Food Chains

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The search for food products from sustainable chains has increased in the past years, motivated by consumers' interest in reducing the negative environmental, economic, and health impacts of their food choices. However, it is not yet clear whether transparency expectations of sustainable food chains influence in consumers' perception of this food products. The literature shows that there are gaps in the growth of sustainable product consumption is the transparency of production and the provision of more information to consumers. In this paper, we aimed to better understand what is the role of transparency expectations and how they influence consumers' decision to consume sustainable food products. Based on scales already validated in the literature, a theoretical model with nine hypotheses was proposed. A questionnaire was structured and empirically tested through a survey with 136 consumers of food from alternative networks. Six hypotheses were validated. Three segments of consumers target were identified from an exploratory factor analysis and cluster. Based on the results some marketing actions were suggested for the participants of alternative food networks. Other studies may validate the model proposed here.

Keywords: sustainable consumption, food chain transparency, sustainability, consumer behavior, alternative food system

INTRODUCTION

Consumers' desire to eat food products from sustainable chains, such as alternative food networks has been increasing in the past years (De Bernardi and Tirabeni, 2018; Fourat et al., 2020). One of the main reasons for that is the fact that consumers expect such food products to have lower environmental impacts and greater positive impacts for local economies, the environment and for the health of individuals, including workers and consumers (Maier et al., 2020). The alternative food networks are "very diverse," including short commercialization circuits, such as fresh produce fairs, delivery of weekly baskets, small producer stores, agrotourism, and institutional sales for school meals (Brandenburg et al., 2015). One of the most recognized examples of alternative food networks is the Community Supported Agriculture (CSA), which consists of a partnership between producers and consumers, in that consumers can have access to local and organic food, and producers have the certainty that their production will be sold at a fair price. The pandemic of COVID-19 has accelerated this movement toward sustainable food chains (Ricker and Kardas-Nelson, 2020; Chiche and Lachapelle, 2021; Futemma et al., 2021). This increasing interest for

sustainable food products is aligned with today's critical and ethical consumerism, highly concerned with environmental impacts and effects on health and food consumption (Grunert et al., 2014).

Brazil is a big country, with a dimension of more than 8 million km² and more than 212 million inhabitants. From the one side, the country counts with the presence of large agri-food chains, such as soybeans, corn, wheat, and sugar. From the other side, data from the 2017 to 2018 Agricultural Census, conducted by the Brazilian Institute of Geography and Statistics (IBGE), reveal that almost 80% of Brazil's rural establishments were characterized as belonging to family farming. While not all family farms can be characterized as alternative food networks, they are more likely to participate in such actions, including short circuit commercialization, organic production practices, etc. Even though the availability of data concerning alternative food networks is still limited, we can infer that they are especially present in the state of São Paulo. One of the arguments that gives support to this is the fact that organic production in São Paulo is higher than the Brazilian average (2.6% of all agricultural establishments in the state, while the Brazilian average is 1.3%; IBGE, 2019).

In Brazil, alternative network foods have also been the focus of some studies. The following are some of them: the role of transaction costs in the intensity of organic food consumption in Brazil (Cechin et al., 2021), an evaluation Brazilian cocoa production chain from the perspective of sustainable rural development (Gontijo, 2020), short food supply chains (Queiroz, 2021), the proposal of a theoretical model for the diagnosis of transparency in the food sector (Nicastro and dos Santos, 2021), and finally, how to contribute to sustainability being economically from cases of alternative food systems (Fialho, 2020). However, no study focusing on consumers' expectations on the transparency of sustainable food chains.

It is already supported by the literature that environmental values and concerns about supporting local communities are among the reasons why people join sustainable food chains, such as CSAs (Brehm and Eisenhauer, 2008). Concerns about food quality and how food is produced have also been recognized as one of the most relevant motivating factors for participating in such initiatives (Brehm and Eisenhauer, 2008). Questions about quality and food practices have played an important role in increasing demands on transparency in the food supply chain. However, little is known about the role of transparency of the food chain in consumer behavior. Nevertheless, "the growing popularity of transparency in supply chains and networks" are not "accidents or fads that are soon to be replaced" (Mol, 2015). Rather, "transparency in value chains is there to stay" (Mol, 2015). Also, although "generally assumed to empower the powerless, transparency in sustainable chains can as well empower the powerful" (Mol, 2015).

"Transparency might be perceived differently between individuals because its perception is mainly determined by the limited ability of individuals to collect, process and transfer information, as well as by subjective feelings and experiences in the past" (Deimel et al., 2008). Karg (1990) describes perceived transparency as the feeling of being informed

about something and defines it as the availability of relevant information as experienced by the individual that makes processes subjectively distinct and clear. Deimel et al. (2008) compared the transparency of the pork and dairy chains of production as experienced by farmers. They found that transparency was higher in the dairy than in the pork business, influenced by a lower number of transaction partners and a tendency toward a longer-term governance structure. Also, "the explicitness and clearness of information exchanged and the levels of trust and commitment were higher in the dairy sector" (Deimel et al., 2008). The authors call for further research on the transparency of food chains.

In their study (Bhaduri and Ha-Brookshire, 2011), found that consumers "questioned the legitimacy of the claims made by the businesses with regard to their transparent supply chain practices." In this sense, they required a "standard seal" or "seal of approval" which would certify businesses' transparency efforts to ensure the businesses are "living up to a particular standard of operations and, thereby, giving consumers the confidence to make an educated decision." They demand a "standard authorizing agency to verify the claims of the transparent businesses."

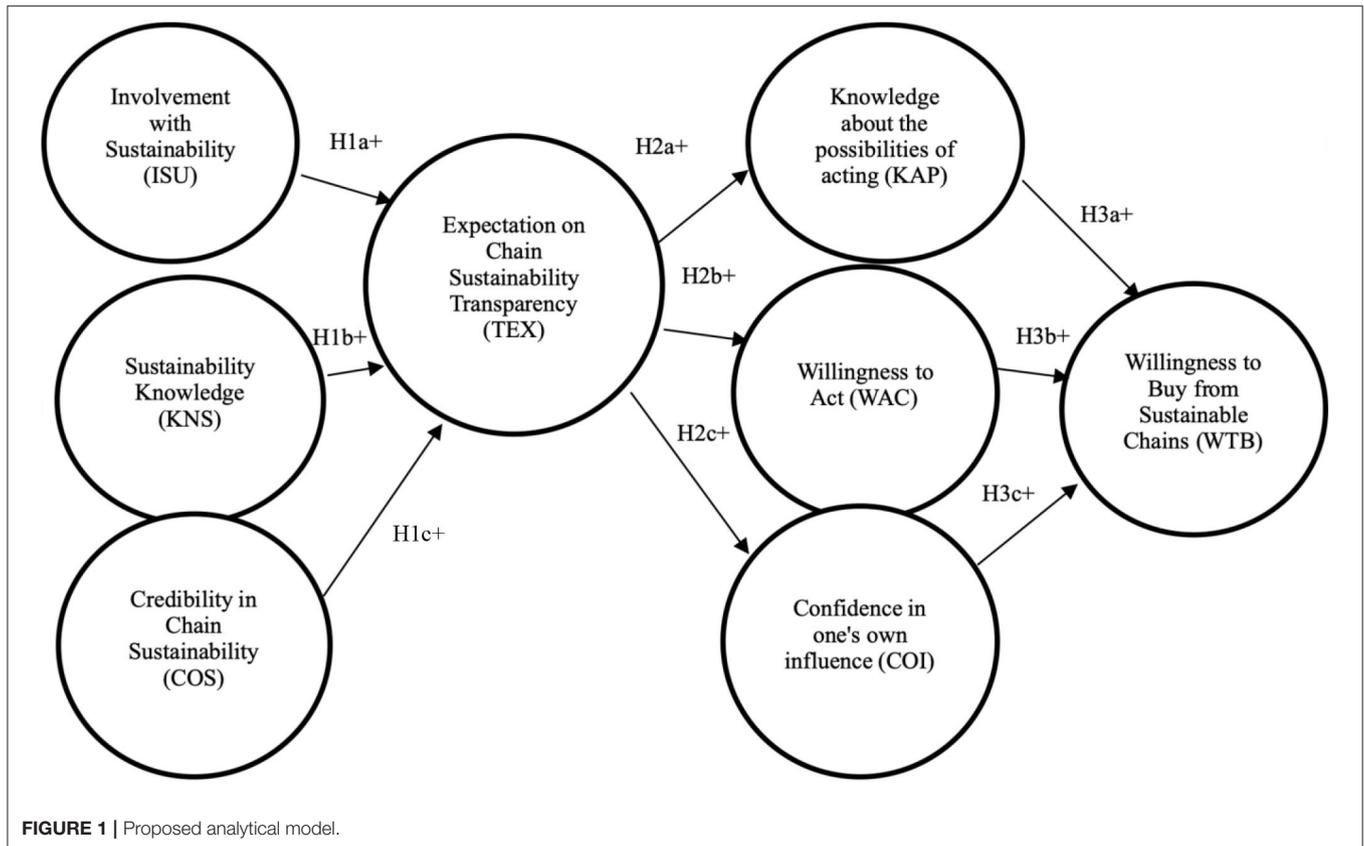
Grunert (2011) proposes six gaps that hinder the consumption of food with sustainable characteristics. They are: (1) exposure does not lead to perception, i.e., consumers simply do not notice the label, because they are in a hurry to buy and most shopping is done habitually; (2) perception leads only to peripheral processing, i.e., consumers see the label, but do not bother to make the effort to understand what it means; (3) the consumer makes "wrong" inferences, i.e., he looks at the label, however he relies on "wrong" reasons; (4) eco-information is offered with other criteria, i.e., the price may be higher, but the taste is not good and the family may prefer something else; (5) lack of environmental awareness and/or credibility, i.e., consumers who want to make sustainable choices may find it difficult to do so in practice, and finally, (6) lack of motivation at the moment of choice, i.e., although consumers have a positive attitude toward sustainability, this attitude is not so strong as to affect behavior in all situations where sustainability may be a relevant criterion. We can say that consumers "forget" their positive attitude toward sustainability when making their food choices. These "latent" attitudes are an important factor in explaining the discrepancies between attitude and behavior.

In this paper, we aim to understand the importance of transparency of the chain in consumers' perception, including both the lack of information, and the gaps involving the motivation and decision to consume food from sustainable chains. Thus, we aim to answer the following research question: What is the role of transparency expectations in consumers' decision to buy food from sustainable chains?

METHODOLOGY

Research Hypotheses

Based on the literature review, nine hypotheses were formulated and are presented in **Figure 1**. We used the database Web of Science and the criteria for keywords and the literature



review was based on the terms “transparency of the chain” and “alternative food and networks.” The first group of hypotheses are related to the expectation of chain sustainability transparency (TEX). As antecedents of this expectation, we have involvement with sustainability (ISU), knowledge about sustainability (KNS), and credibility in chain sustainability (COS). Therefore, we formulated the following hypotheses:

H1a: Engagement with sustainability (ISU) is directly related to expectations about the transparency of the chain’s sustainability (TEX).

H1b: Knowledge about sustainability (KNS) is directly related to expectations about the transparency of the chain’s sustainability (TEX).

H1c: Credibility in chain sustainability (COS) is directly related to expectations about transparency of the chain’s sustainability (TEX).

The second set of hypotheses is related to the consequences of the expectation of transparency of the sustainability of the chain (TEX). These consequences would be related to attitudes such as knowledge of the possibilities for action (KAP), willingness to act (WAC), and confidence in one’s own influence (COI).

According to Mol (2015), consumer transparency involves the disclosure of production and product information related to claims of sustainable production processes and products through public or private labeling and certification. Organic, green, fair

trade, and all types of other sustainability products and processes are articulated in standards, disclosed in certifications, labels, and information systems can be called consumer transparency (Mol, 2015). It is expected that these behaviors will happen with more intensity or likelihood when the expectation about the transparency of the sustainability chain is also higher:

H2a: Expectation about the transparency of the chain’s sustainability (TEX) is directly related to knowledge of the possibilities for action (KAP).

H2b: Expectation about transparency of chain sustainability (TEX) is directly related to willingness to act (WAC).

H2c: Expectation about transparency of chain sustainability (TEX) is directly related to trust in one’s own influence (COI).

Finally, the third group of hypotheses relates the three attitudes of the previous hypotheses to the willingness to buy from sustainable chains (WTB). The attitudes are: knowledge about the possibilities to act (KAP), willingness to act (WAC), and confidence in one’s own influence (COI). Similarly to the previous hypotheses, it is expected that the higher the intensity of these attitudes the more likely will be the desire to buy from transparent and sustainable chains. Therefore, we formulated the following hypotheses:

H3a: Knowledge about the possibilities of action (KAP) is directly related to the desire to buy from transparent and sustainable chains (WTB).

H3b: Willingness to act (WAC) is directly related to the desire to buy from transparent and sustainable chains (WTB).

H3c: Confidence in one's own influence (COI) is directly related to the desire to buy from transparent and sustainable chains (WTB).

Design of the Study and Data Collection

To achieve the aim of this paper we applied a quantitative study design. A field survey was carried out to test the hypotheses elaborated in our proposed model. The population was defined as any consumer of food from alternative networks from the state of São Paulo. We focused on this state because it concentrates most Brazilian consumers of food from alternative networks. The sample was defined as non-probabilistic, and the questionnaire was structured in the Google Forms platform and distributed randomly through snowballs on social networks such as Facebook and LinkedIn, as well as message applications such as e-mail and WhatsApp. As there is no official data regarding the population consuming this type of food, it was not possible to stratify the sample for statistical inference. The main focus was to ensure that the respondents were consumers of alternative food and, therefore, able to answer the questions with confidence. The minimum number of individuals necessary for the analysis of the proposed model (Figure 1) was 127 and was calculated using the GPower software (Kang, 2021). The collection period was from August 18 to 30, 2021. We collected 145 responses, 11 individuals being discarded from the analysis of variance and outliers. To analyze the results, we used univariate and multivariate analysis (Malhotra et al., 2017). Part of the research was causal type, with hypothesis testing conducted using the Confirmatory Factor Analysis method. Another part of the research was descriptive, with the use of quantitative methods, but without the presence of a dependent variable: Exploratory Factor Analysis and the Cluster Analysis (Hair et al., 2009b).

Even though the research included consumers from all over Brazil, the survey covered mainly the state of São Paulo because it has the highest level of urbanization and concentrates most of the country's higher income and higher education level population (IBGE, 2010). These characteristics make this state the main target audience of alternative food network initiatives.

To ensure the validity of the data collection instrument, the original scales used in the questionnaire were translated from English into Portuguese and the final version was approved by three researchers specialized in the marketing area. The objective of this translation and linguistic survey process was to ensure that the meaning of the applied statements was consistent with the references used in English and that the questions were not ambiguous, which could affect the integrity of the results. These conditions are recommended by Brislin (1980). In addition, a pre-test was conducted with 30 participants to avoid problems with the understanding of the respondents, to adjust some terms, as well as to identify problems regarding the completion of the questionnaire. The pre-test was applied 30 days before the data collection, using the same criteria for the selection of the final sample.

The final questionnaire applied included 37 questions, with five questions characterizing the respondent and 32 in a

TABLE 1 | Discriminant validity of the constructs.

Latent variable	IOC	COS	ISU	KAP	KNS	TEX	WAC	WTB
IOC	0.828							
COS	0.404	0.808						
ISU	0.487	0.365	0.879					
KAP	0.556	0.380	0.341	0.870				
KNS	0.315	0.078	0.458	0.425	0.907			
TEX	0.444	0.574	0.434	0.420	0.420	0.684		
WAC	0.794	0.501	0.614	0.527	0.280	0.488	0.925	
WTB	0.625	0.464	0.635	0.326	0.259	0.451	0.751	0.893
CR*	0.897	0.904	0.931	0.925	0.933	0.777	0.946	0.940
CA**	0.845	0.867	0.901	0.889	0.893	0.642	0.915	0.915
AVE***	0.686	0.653	0.772	0.758	0.823	0.468	0.855	0.798

Source: Original research data.

*CR, Composite Reliability.

**CA, Cronbach's Alpha.

***AVE, Average Variance Extracted.

seven-point Likert scale format, ranging from 1 (strongly disagree) to 7 (strongly agree). These questions represent dimensions validated in the literature and the respective articles of these scales can be found in the Appendix 1.

With the intention of verifying the measurement quality of the proposed theoretical model, a confirmatory factor analysis (CFA) was performed using variance-based structural equation modeling. This evaluative method allows to verify the fit of the collected data structure to the theoretical model (Hair et al., 2009a), through a combination of dependence (factor analysis) and interdependence (multiple regression analysis) techniques (Hair et al., 2016). Data were analyzed using SmartPLS software version 3.3. The reliability of the proposed scales was tested, as well as their convergent and discriminant validations (Table 1). To identify the validity of the constructs, it was verified if the variables really belong to the construct to be measured, being that the more abstract the construct, the greater the difficulty in establishing its validity (Souza et al., 2017). The hypotheses raised in this study, described in the model presented in Figure 1, were tested using the same SmartPLS software, followed by a set of multiple regression equations.

In order to group the questions into dimensions based on consumer perception and then group them among consumers, an exploratory factor analysis was performed using the Principal Components extraction method and rotated using the Varimax method with Kaiser normalization (Appendix 4). To perform the cluster analysis or segmentation the K-means method was used. Three clusters were previously chosen and the factor loadings obtained in the exploratory factor analysis were used as a source of information.

RESULTS

Regarding monthly family income, the average value was concentrated in 14,400 Reais (~US\$2,880.00). The average age of

TABLE 2 | Evaluation of the structural model.

	Original sample (O)	VIF	Sample mean (M)	Standard deviation (STDEV)	T statistics (O/STDEV)	P-values
H1a: ISU -> TEX	0.092	1.467	0.104	0.083	1.104	0.270
H1b: KNS -> TEX	0.338	1.297	0.340	0.080	4.238	0.000**
H1c: COS -> TEX	0.514	1.167	0.509	0.083	6.170	0.000**
H2a: TEX -> KAP	0.420	1.000	0.426	0.084	5.018	0.000**
H2b: TEX -> WAC	0.488	1.000	0.494	0.079	6.140	0.000**
H2c: TEX -> COI	0.444	1.000	0.453	0.082	5.380	0.000**
H3a: KAP -> WTB	-0.120	1.490	-0.113	0.093	1.298	0.195
H3b: WAC -> WTB	0.717	1.000	0.678	0.130	5.505	0.000**
H3c: COI -> WTB	0.122	2.909	0.155	0.124	0.989	0.323

Source: Original research data.

N = 134.

**Mean significance level at $p < 0.01$.

the participants was ~39 years old, with a standard deviation of 12.82. Regarding gender, the sample was equally distributed, with 50% of the participants being female and 50% male. Most of the interviewees, 47.01%, had a graduate degree. The general profile of the sample is described in **Appendix 2**.

Regarding the Likert-type questions, the ones with the highest agreement were “I believe that what each person does is important for sustainable development” (Mean = 8.93, Standard Deviation 1.67), “I would buy food from transparent and sustainable chains if it is available where I shop” (M = 8.75, SD = 1.82), and “There is a high probability that I will buy food from transparent and sustainable chains in the future” (M = 8.69, SD = 1.95) (**Appendix 3**).

In relation to the affirmations that consumers most disagreed, they were: “Alternative food producers use registered workers to produce their products” (M = 5.66, DP = 1.93), “I wanted/ I could easily find out about the working conditions on farms that produce alternative foods” (M = 5.16, DP = 2.82), and “People who know me, consider me an expert in the area of food sustainability” (M = 3.97, DP = 2.69). The results show that even though the respondents are involved with alternative foods, they demonstrate little knowledge regarding technical issues about their production and food sustainability.

Confirmatory Factor Analysis

Although the variables were taken from the literature, their subsequent adaptation for the purposes of the present study warranted validation. The validation process was carried out using the total sample of 134 participants. The results of this confirmatory analysis are summarized in **Table 1**.

It was observed that the assumptions of reliability and convergent and discriminant validity were met for all scales. Through the Average Variance Extracted (AVE), we obtained a value >0.500 (acceptable load) for all the constructs, with the exception of the latent variable TEX (0.468). Although the latter does not meet the stipulated value, the theoretical complexity presented in the paper is reasonable justification to consider this value acceptable in these circumstances.

The composite reliability (CR) for all constructs was considered to be above 0.700, which is an acceptable load for this variable (Fornell and Larcker, 1981; Hair et al., 2009a). Even with an AVE of <0.5, it is noted that TEX also showed a CR above 0.7, a characteristic also obtained for other authors’ valid constructs (Lam, 2012). Finally, the effectiveness analysis of the discriminant validity tests, according to the precepts of Fornel and Larcker (1981), evaluated possible construct relationships with the other variables and did so, successively, in all cases. The square root values of the AVE, on the diagonal of the **Table 1** (highlighted in bold), confirm that the constructs are indeed valid. Therefore, the results of the confirmatory analysis of the constructs show that the adaptations made to categorize and measure the dimensions of interest in this paper were effective.

Hypothesis Validation

The results applicable to the structural model analysis show that six out of the nine hypotheses tested were supported at a significance level of $p \leq 0.01$, as shown in **Table 2**. It can be noted that all significant relationships between the constructs proposed in the hypotheses were positive, as expected. Contrary to expectations, hypotheses H1a, H3a, and H3c were not significant.

The inflation variance factor (VIF) values were >1,000 for all the hypotheses, indicating no multicollinearity (Bowerman and O’Connell, 1990). All VIF values are acceptable, since they are below 3,000, as explained by Ringle et al. (2015).

When it comes to the first group of hypotheses (H1a, H1b, H1c), we wanted to understand consumers sustainability transparency expectations. As H1b and H1c were supported by our data, we confirmed that as consumers show a greater knowledge about sustainability, their expectation of transparency of the sustainability of the chain also increases. Also, the greater the credibility in the sustainability of the chain, the greater the expectation of transparency. Contrary to what we expected, our results do not support the affirmation that engagement with sustainability is directly related to the expectation about the transparency of the chain’s sustainability (H1a).

The results indicate that higher expectations about the sustainability and transparency of the chain generate three types

of attitudes: a desire for greater knowledge of the possibilities of action (H2a), a greater willingness to act (H2b) and, greater confidence in one's own influence (H2c). All of these were confirmed, including their positive relationship, which indicates greater engagement and proactivity about food from alternative networks. This is an indication that transparency may play an important role in generating action toward food from alternative networks. The three hypotheses were confirmed, including their positive relationship, which indicates greater engagement and proactivity about food from alternative networks.

Finally, from the third group of hypotheses, only H3b was supported by our data, confirming the affirmation that willingness to act is directly related to the desire to buy transparent and sustainable chains. On the other hand, we found that knowledge about the possibilities of action (H3a) and confidence in one's own influence are not directly related to the willingness to buy from transparent and sustainable chains. One of the explanations for that may be the low self-confidence derived from the still low knowledge of consumers about the production process of these foods. As evidenced earlier, the questions about knowledge about food from alternative networks were the ones with the lowest average agreement. These results suggest, therefore, the need for communication actions to generate an active attitude from the consumer in searching for this type of product. More engaged, with more knowledge and confidence, these consumers can become influencers of other consumers.

Cluster Analysis

We performed an exploratory factor analysis using the Principal Components extraction method and rotated using the Varimax method with Kaiser normalization (**Appendix 4**). Based on the 23 Likert-type questions, six factors were obtained, which explained 72.53% of the variance (**Appendix 5**). The factors were: (1) Action and likelihood of sustainable food consumption (15.84%); (2) Credibility and expectations of chain transparency and sustainability (13.12%); (3) Confidence in own influence (12.38%); (4) Action on sustainable development (11.54%); (5) Concern about sustainable food (9.86%) and finally; (6) Knowledge about food sustainability (9.80%). The total variance explained is generally not 100%. This metric indicates how well the questions asked evaluate the entire variance. The values of each factor above 3% demonstrate that the data were aggregated consistently and the explained variance above 60% demonstrates that the set of questions measure what we aimed to analyze (Fabrigar and Wegener, 2011). The remaining factors have eigenvalues smaller than 1 and are, therefore, considered to be unexplained variance.

The cluster analysis revealed the existence of three clusters (**Appendix 6** brings more information about each cluster or segment). Cluster 1, called Acting, is composed of consumers that are active in relation to sustainable food and are more likely to consume this type of product. This cluster is made up of 54.05% females, single (64.86%), aged 18–37 years (46.27%), complete college education (32.43%), living in a family of three people (29.73%), family income from R\$1,001.00 to R\$10,000.00 (49.97%) and residing in the state of São Paulo (83.78%).

Cluster 2, called Confident, is formed by consumers that are confident in their own influence, as they show preoccupation about sustainable development worry. The profile of consumers is majority of females (52.33%), married (51.16%), between 18 and 37 years old (62.16%), with a complete post-graduation course (53.49%), living in a family of four people (29.07%), with a family income of R\$1,001.00 to R\$10,000.00 (50%), and living in the state of São Paulo (83.72%).

Cluster 3, called Indifferent, is made up by consumers that are less active when it comes to acquiring food from sustainable networks. This cluster is formed by 81.82% of males, married (54.55%), between 38 and 57 years old (69.64%), with complete post-graduation (54.55%), living in a 3-person family (54.55%), with a family income of R\$1,001.00 to R\$10,000.00 (60%), and living in the state of São Paulo (63.64%).

CONCLUSION

The results confirm the existence of gaps mitigating the consumption of sustainable products are also present in the research's target audience. Therefore, more effective communication strategies focused on both increasing consumer understanding and increasing motivation for action regarding sustainable food chains are suggested. Both positioning and tactical marketing actions, i.e., price, product, promotion and place, should be tailored to the three identified segments: Active, Confident, and Indifferent.

Our results on the first group of hypotheses indicate credibility and knowledge about sustainability generate the expectation of transparency of alternative food networks (hypothesis H1b and H1c). In managerial terms, the results indicate that the actors belonging to sustainable food chains should invest in knowledge and increase credibility to consequently increase expectations about the transparency of their products and practices. Campaigns focused on credibility and transparency with the endorsement of digital influencers can be an effective motivation to intention-to-buy action. Also, actions in social media with the generation of informational content can raise awareness about sustainability. However, we observed that consumers need to be encouraged and communicated about the transparency of alternative food networks, once being involved with sustainability was not enough to generate the expectation of transparency. Perhaps one of the explanations is the fact that the involved consumer is more skeptical about the capacity of chains to be sustainable or even that their expectation level is already high and, therefore, no longer subject to change (hypothesis H1a). Therefore, there is a need to improve the perception of transparency for consumers involved with alternative network foods. This could be solved through a direct engagement with the alternative food network initiative. For example, the research conducted by Savarese et al. (2020) explored the consumer-farmer relationship in Community Supported Agriculture (a type of alternative food network) and found that consumers felt really engaged whenever they had a "strong and direct relation with the farmers," including, for instance, sharing the production fees or participating in educational activities. These authors

concluded that engagement is “a key element for the creation of an environment for consumer education and behavior change” toward sustainable consumption practices (Savarese et al., 2020).

Regarding the second group of hypotheses, the results show that transparency is a good antecedent and promoter of action intention about alternative foods (hypothesis H2a, H2b, and H2c). The results suggest that short alternative food chains invest in transparency about the production processes of these foods as well as the benefits they provide (put a reference). For instance, the use of labels that externalize and make tangible the transparency of the practices are interesting actions to culminate in consumer action on this chain. This finding is aligned with the study conducted by De Bernardi et al. (2020), which found that “higher levels of transparency lead to higher levels of quantity and frequency of purchases” from alternative food networks. The authors suggest that farmers “keep their consumers informed about the characteristics of their products” (De Bernardi et al., 2020).

Finally, the third group of hypotheses shows that, although there is a positive availability in relation to the action, it is possible that the intention of buying this type of product does not occur in practice. The results indicate that the purchase of these foods is a more impulsive purchase, based on the willingness to act (hypothesis H3b) and not a more conscious purchase based on knowledge about the possibilities of action and confidence (hypothesis H3a and H3c). Actions in the decision process, as suggested by Grunert (2011) are necessary.

In terms of validity of the research and the collection instrument, although several procedures have been adopted to mitigate possible errors and the metrics of adjustment and statistical tests of the proposed model, some limitations regarding the measurement of the constructs may have occurred, as well as possible biases of the respondents regarding the interpretation of the questions formulated. In terms of sample reliability and possible statistical inference, it is suggested that

the research can be replicated to other types of target audiences and different contexts or even countries, so that the cultural aspect can be evaluated and the proposed model widely validated. The hypotheses that were not validated in this study can be validated in countries where the consumption of foods from alternative networks is more established, such as countries of mature economy.

DATA AVAILABILITY STATEMENT

The original contributions presented in the study are included in the article/**Supplementary Material**, further inquiries can be directed to the corresponding author.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by CONEP. The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

ES was responsible for collecting data, performing data analyses, and revised critically preliminary versions of the paper. RP wrote the first draft of the manuscript. Both authors contributed substantially to the design of the study. Both authors contributed to the interpretation of the findings and contributed important intellectual content. Both authors reviewed and edited the manuscript and approved the final version.

SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: <https://www.frontiersin.org/articles/10.3389/fsufs.2022.853692/full#supplementary-material>

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