Cross-Cultural Comparison of Sustainable Agro-Food Consumption from Consumers’ Perspectives: Cases from Taiwan and France

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Abstract: Sustainable agro-food consumption is a model intended to conserve the resources of today for future need. Consumers play a crucial role in transitioning towards sustainable food consumption, as they judge the attributes of products on the market and are the final decision-makers when it comes to changing consumption habits. Consequently, investigations on agro-food consumption from consumers’ perspectives are of great value. Therefore, we first referred to 60 articles to summarize 11 important factors of sustainable food consumption and identified three possible policy measures from the perspectives of consumers and cultural conditions, evaluating them using cases from both Taiwan and France. In addition, this study showed the dissimilarities between eco-consumption preferences for the two case areas, also evaluating consumers’ expectations on future policy alternatives through the application of the analytical hierarchy process (AHP) and a survey. Moreover, demographic comparisons have been undertaken to support, explain, and re-examine the results. The results show that the key factors for sustainable food consumption are product accessibility, tradition, and regional factors. Policy measures focus on product certification and information. Due to different perceptions regarding product differentiation, people in Taiwan pay less attention to sustainable food prices. In France, obvious age-differentiated preferences as regards the promotion of policies were revealed: young people preferred certification, whilst elderly people preferred the provision of information.

Keywords: sustainable consumption; consumer perspective; agro-food chain; cross-cultural survey; analytical hierarchy process (AHP)

1. Introduction

The transition to agro-food production and consumption practices within sustainable food-chain development has undergone rapid expansion and its achievements have attracted much attention [1]. Many active implementations of sustainable consumption and production (SCP) are currently in progress across 178 countries of the world [2]. Organic production brings economic prosperity, social and environmental benefits, and advantages in rural development. It is irrefutable that the choice to consume organic foods has gained much popularity in the world of today, following realizations surrounding healthy self-improvement needs [3–5]. In light of this continuing trend, SCP is considered to be of great importance.

Sustainable production aims to further solidify economic and social progress whilst maintaining environmental harmony. Presently, organic production is an integrated system that incorporates organic food production and management with environmental concerns, reflecting congruence with social norms on sustainable consumption. However, consumers’ attitudes toward sustainable agro-food (SAF) consumption correlate to omnipresent factors,
for instance, the tastes, habits, lifestyles, food safety concerns, environmental considerations, and confidence of buyers. As expected, consumers’ awareness about the aforementioned factors have brought about changes in purchase patterns, signifying end-users’ preferences and eventually prompting the advancement of organic production. Consumers’ perspectives account for a large proportion of SAF purchasing, leading to the necessary further inspection of buyers’ credence toward SAF consumption [2,6,7]. Unequivocally, the progression of the effective investigation of SAF consumption requires the perspectives of consumers. However, compared to the analysis of manufacturers’ perspectives, the scrutinization of consumer’s perspectives regarding sustainable development has proven rather challenging, as the individual cognition process regarding green food consumption is relatively more complex than the measurement of manufacturing procedures. In fact, the transference of consumer perspectives from conventional to sustainable agro-food consumption is representative of accumulated social norm shifting, which often involves many intangible elements of decision making [8]. Although organic foods are considered mainstream now, previous papers have reported that consumers’ attitudes towards sustainable food consumption and purchasing behavior are not consistent [2,9]. Therefore, this research aimed to contribute its findings by exploring consumers’ perspectives on sustainable agro-food consumption.

In addition, the dynamics of different cultures, as well as individual competences across borders as regards sustainability, result in the need for further, sufficient studies to be undertaken on this topic. Due to improvements in quality of life and a shift in values from a traditional diet to a healthy diet in Asia, the consumption of organic food in Asia is on the rise, reflecting consumers’ increasing preference for organic products [5,7,10]. Therefore, France and Taiwan were chosen for this cross-cultural comparison, to further compare consumer views from organic sectors of different maturity. Additionally, this investigation can add to the bigger picture regarding consumers’ perspectives on food consumption in Asia [11]. The crucial value of this cross-cultural study is that it shows different developing pathways and may be used as a blueprint for further investigations. For these reasons, the present paper was written with the aim of revealing and prioritizing effective factors of sustainable food consumption from buyers’ perspectives in Taiwan and France, with the following objectives:

- To identify factors, including the principal and sub-factors, that affect the implementation of sustainable agro-food (SAF) consumption from the literature (Section 2).
- To establish a systematic hierarchical analysis framework and factor linkages for SAF consumption (Section 3).
- To prioritize and recognize the most critical factors in implementing SAF from consumers’ perspectives in Taiwan and France (Sections 4.1 and 4.2).
- To investigate discrepancies between the two compared case studies as regards civil motives and policy making surrounding SAF consumption (Section 4.3).
- To explore the attitudes toward SAF across different gender, age, marriage, and education levels, from both consumption and policy sides (all Section 4).
- To analyze and discuss factors of SAF consumption and list similar trends and different considerations in Taiwan and France (Sections 5 and 6).

2. Background and Literature Review

Sustainable agro-food consumption is related to diverse macro- and individual-level factors. For instance, macro factors such as the availability of green foods [3,12–14], the affordability of certain food options [5,9,10,15–17], the health and safety concerns of organic agro-foods [4,7,10,18–21], transportation and distributions systems [22–25], and the ecological concerns of the food supply [7,12,26,27] were inspected from previous studies. In recent years, more individual factors were examined, for example, consumers’ awareness on SAF purchasing [12,28–30], perceived values of green food [31], and the shifting social norms over years of promulgation on SAF consumption [10,17,19,20,32].

In particular, social norms, referring to beliefs, values, attitudes, and behaviors of a group of people, play an essential role in sustainable purchasing behavior from end users’
view [20]. Exploring social norms of SAF consumption remains key to understanding consumers’ perspectives and purchase intention [10,19]. Studies on the effectiveness of social norms have shown that social message exposure may influence consuming choices in food intakes [20]. Consumers with more favorable attitudes toward organic foods demonstrated higher levels of health concerns and advisable consumption behavior [33]. Correspondingly, interpersonal related factors such as trust and tradition also addressed their efficacy in influencing food consuming behavior [7,9,23,25,34–38]. In addition to the affective influence on attitudes and judgements surrounding SAF consumption, social norms also highlight consumers’ preferences as powerful interventions to govern consumers’ decision making between individual behaviors and social factors [10,14]. Though contemporary research in the effectiveness of social norms and organic food consumption is sparse but growing, people’s overall beliefs, values, attitudes, and behaviors, by all means to explain and also to influence their sustainable agro-food consumption choices [19].

Considering that the composition of social norms is inextricably intertwined with individual values and beliefs, consumer awareness of product quality, understanding and confidence of SAF is an essential factor of the study. The latest research has confirmed that one’s distinct levels of knowledge, experience, and engagement toward green product consumption yield different effects on people’s preference formation [31,39]. The more positive the attitude of an individual awareness towards the SAF consumption, the stronger the consumers’ intention to perform their purchase behavior [5,39]. In general, consumers’ health consciousness, knowledge regarding green foods, environmental concerns, animal welfare, and purchasing power are in relation to consumers’ willingness to purchase organic food. To be more specific, egoist factors, defined as consumers’ health-related concerns, were better predictors to organic food purchase behavior than altruistic factors that related to environmental concerns [34,35]. Similarly, sensory pleasure of green food contributes is related to the taste of habit, which help to drive the demand and consumption of SAF [9,40]. Previous studies have investigated that the taste and quality of SAF accelerated sales of organic foods, being one of the critical factors that influence consumers’ level of preferences [16,36–38,41].

Although recent studies on navigating SAF consumption from the implicit aspect continue to be lauded by researchers, challenges of structural constraints have not gone unnoticed. To better understand the perspectives of consumers’ SAF preferences, it is important to also capture consumers’ perceptions on external constraints. For that, the distribution of SAF interacts with providers’ pricing strategies; it is directly related to consumers’ economic status [17,25]. Consequently, price fairness was proven to have its impact on purchase behavior [41,42]. Constraints of the kind also include the availability of SAF [12] and the possibility of locally sourced “locavore” channels [37,43–46]. To this end, as shown in Table 1, the study design consisted of three key factors (social norms, consumer awareness, structural constraints), and 11 sub-factors.

| Table 1. Identification of factors to SAF consumption. |
|-----------------------------------------------|
| **Key Factors** | **Sub-Factors** | **References** |
| Social norms | Health and safety | [1,5,7,12,27–29,33,47] |
| | Ecological concerns | [3,4,7,21,36,39,43,48,49] |
| | Social responsibility | [33,50] |
| | Tradition and region | [23,27,29,43] |
| Consumer awareness | Sensory pleasure | [3,23,29,43,47,51,52] |
| | Product quality | [3,43,47,50–52] |
| | Product understanding | [3,18,23,29,33,36,39,51] |
| | Product confidence | [3,11,33,39,45,50,53] |
| Structural constraints | Availability of products | [3,12,43,45,47] |
| | Acceptability of price | [18,23,33,43,47,48,50,52] |
| | Possibility of locavore | [43,44,46] |
Considering possible solutions to the external hurdles that promulgate civic engagement for more sustainable consumption, the adaptation of policies to bolster SAF consumption would be considered effective actions. To address the development of SAF, Taiwan government has restructured its agricultural sector to ensure the competence of SAF supply. Major policy launched featuring the application of technological innovations in sustainable agriculture, ensuring the reduction of pesticides and the enhancement of the Certificated Agriculture Standard on food safety [54]. The French government centered its policy on sustainable management of agricultural benefits and food education [55]. Indeed, specific public policy options on building solid certification systems and the promotion of SAF education may result in positive feedback in terms of better understanding and trust in green products [13,23,38]. In addition, policy measures of socially responsible and eco-friendly initiatives from the manufactory side may concretely buttress the development of SAF production [9,46]. It will come as no surprise that the enacting of policies and services help build necessary SAF knowledge and trust in certification systems [17,56]. To envision a practical use of the research outcomes, this study was also targeted at revealing consumers’ perspectives on possible political enhancement to SAF consumption, with three most frequent mentioned factors from previous studies in this regard: the promotion of education and information, reinforcement of certification and inspection systems, incentive of eco-friendly initiative and social-responsible initiatives. References in this respect are shown in Table 2.

Table 2. Alternatives of political enhancement to SAF consumption.

| Political enhancement                                      | [2,36,57]                  | [2,11,23,29,36]                 | [7,22,48,49,52,56]               |
|------------------------------------------------------------|----------------------------|---------------------------------|---------------------------------|
| Promotion of education and information                     | Reinforcement of certification and inspection systems | Incentive of eco-friendly initiative and social-responsible initiatives |

In sum, to regard consumers’ perspectives toward sustainable agro-food purchasing requires examinations from distinguishing potential consumers’ preferences on social norms, as well as the individual awareness on SAF consumption as the implicit motives, and additionally, to evaluate consumers’ view on structural constraints and possible policy reinforcements as the explicit factors may identify consumer expectations on facilitators and barriers toward SAF consumption, reconnecting food producers and consumers. The improvement of SAF patterns is more likely to occur if coordinated and focused action from government, organization management as well as consumers and with the public integrated.

Against this background, the major contribution of this study is to provide SAF providers and policymakers with a scientific basis knowledge to understand consumers’ expectations and preferences for sustainable food consumption through analytic hierarchy process (AHP). AHP is considered a solution methodology, a theory of measurement through pairwise, multi-criteria analysis [58]. The wide adoption of AHP in agricultural sustainability has indicated its efficacy on gauging stakeholders’ importance weights on agricultural greenhouse structures, sustainable consumption and production, and agricultural environmental management. By far, AHP studies have revealed the government support and policy-related barriers accounted for the top importance among the other dimensions (management-related, resource- and expertise-related, and stakeholder-related barriers) in formulating global-wide sustainable consumption and production strategies, showed consistency on the economic dimension from farmers’ and agricultural specialists’ perspectives on different greenhouse techniques, and the integration of sustainable agricultural productions and land evaluation [59–61]. With the features on logically prioritizing preferences as well as refining the coherence of determining factors in decision making, a key research approach of understanding the above-mentioned is the use of AHP measurement as the solution method of the present study.
3. Materials and Methods

3.1. Theory of Analytic Hierarchy Process (AHP)

To analyze the most important elements influencing consumers’ willingness to buy towards sustainable consumption, we apply the analytic hierarchy process (AHP) introduced by Saaty [62]. The advantages of this method include its systematic scoring approach [63], which met the need of our multi-criterion decision-making study. Moreover, this method has been applied to many agricultural and food sector in order to find the best solution or alternative, for example, [24,26,63]. The characteristics of AHP process are that it can consider multiple attributes to estimate their relative scores, during the calculation process, the three steps repeat to go through every comparison between criteria, attributes, and alternatives: (i) pairwise comparison matrix, (ii) the eigen method, and (iii) consistency ratio. The detailed execution steps are briefly described as follows:

i. Set up the hierarchy by breaking down the goal into several interrelated decision elements and their corresponding attributes.

ii. Collecting data by making a series of pairwise comparisons among all the levels: the input data are usually collected from surveys. The 9-point scale is applied to translate respondents’ opinions into numerical quantities, respondents evaluate the off-diagonal relationship in each box. The rule is as follow:
   - 1 means criteria A and B are equally important;
   - 3 means criteria A is thought moderately more important than B;
   - 5 means criteria A is thought to be strongly more important than B;
   - 7 means criteria A is thought to be / has been demonstrated to be much more important than B;
   - 9 means criteria A has been demonstrated to be much more important than B. Respondents have to rate their perceived scores from 1/9 to 9 (1/9, 1/7, 1/5, 1/3, 1, 3, 5, 7, 9). Then, the pairwise comparison matrix will be:

\[
R = \begin{bmatrix}
1 & r_{12} & \cdots & r_{1n} \\
\frac{1}{r_{12}} & 1 & \cdots & r_{2n} \\
\vdots & \vdots & \ddots & \vdots \\
\frac{1}{r_{1n}} & \frac{1}{r_{2n}} & \cdots & 1
\end{bmatrix},
\]

where \( r_{ij} \) is an attribute between criteria \( i \) and \( j \); \( n \) is the number of attributes.

iii. Estimate the weights of importance based on respondents’ perceived importance and check the consistency ratio. The weight of importance (or relative weight) and consistency are measured in this phase by applying an eigenvalue method on a pairwise comparison matrix. It follows the equation:

\[
a_{ij} = \frac{w_i}{w_j}, \quad i, j = 1, \ldots, n.
\]

where \( a_{ij} \) is the relative importance of attribute \( i \) to attribute \( j \); \( w_i \) is the relative importance of attribute \( i \), \( w_j \) is the relative importance of attribute \( j \). The pairwise comparison matrix is transformed into an eigensystem tableau which is equivalent to \( Aw = nw \). Where \( A \) is an attribute matrix; \( w \) is an eigenvector of \( A \). By solving this eigensystem, the weight of importance can be obtained. We can know the criteria weight and the relative scores of each attribute. As the data may be inconsistent, we need to check the degree of consistency by the consistency ratio (CR). First, calculating the eigenvalue by the following equation:

\[
Aw = \lambda_{\max}w,
\]

where \( A \) is the matrix form of attribute; \( w \) is the weight of importance of matrix \( A \); \( \lambda_{\max} \) is the eigenvalue of matrix \( A \). Secondly, apply the following mathematical equation for consistency ratio: \( CR = CI/RI \) where \( CI \) is consistency index, \( CI = \frac{\lambda_{\max} - n}{n-1} \). Note that \( CR \) is generally acceptable when it is 0.10 or less. However, regardless of the scale applied to
quantify the pairwise comparison, inconsistency may appear. Saaty used a random index (RI) as a reference of CI of a randomly generated reciprocal matrix as Table 3.

iv. Aggregating the weights of importance of all the attributes to arrive at a set of ratings for the alternatives: after proceeding with the above steps to every level of hierarchy, an \( m \times n \) matrix \( R = [a_{ij}] \) can be obtained. Then, obtain an overall priority vector for the lowest level of the hierarchy by calculating the following equation; if there is more than one outcome, the arithmetic average can be taken: \( u_j = \sum_i w_i r_{ij} \). Finally, the best alternative can be calculated by the equation:

\[
a * AHP = \arg \max_j n \sum_{i=1}^n w_i r_{ij}.
\]

v. Improvement of consistency: if \( CR > 0.1 \), the authors of [64] have studied this issue and proposed a calibration method to obtain a weighted geometric mean matrix, which was shown to be consistency acceptable.

Table 3. The mean consistency index of randomly generated matrices.

| n | 1  | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10 | 11 | 12 | 13 | 14 | 15 |
|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| RI| N.A.| N.A.| 0.58| 0.9| 1.12| 1.24| 1.32| 1.41| 1.45| 1.49| 1.51| 1.48| 1.56| 1.57| 1.58|

3.2. The Hierarchical Structure for Sustainable Agro-Food Consumption

To set up the hierarchical form, a literature review was conducted to collect and manage the key elements and their corresponding sub-factors which influence consumers’ purchasing decisions towards sustainable food products. Most of the literature targeted organic products because they are the dominants in the academic studies and markets. The top motives and barriers of the consumption mentioned frequently were selected to construct the hierarchy, so do the political implications mentioned. Based on this step, the hierarchy was structured into four levels: the goal, three principal factors, eleven sub-factors, and three alternatives of policy, as shown in Figure 1. Note that the ideological trends, which are also called social norms in the literature, belong to the macro factor, describing how the social flow impacts citizens’ lifestyles; structural constraints are the consumption limitations of sustainable agro-foods by current social institutions, which should be eliminated to empower consumers’ abilities to change lifestyle, and subjective attributes, which, also called consumer awareness, are personal values about one’s perceived habits, specific attitudes, and preferences, expressing how external factors influence people’s cognitions, and furthermore, how they attain to their needs and goals.

The sub-factors of ideological trends are food health and safety (FHS) providing positive effects on human health as well as reduce the health risks from chemical residues; ecological concerns (ECC) for natural environment, animal living conditions, and the quality of human life; social responsibility (SOR) regarding the welfare and equality of every actor on the food systems; and tradition and region (TRR) for consciousness of the natural regional environment where food products have been made, and the traditional know-how of local producers. The sub-factors of structural constraints are availability of products for the accessibility of products (AVP) and convenience of purchasing from retailers or producers under existing distribution channels; acceptability of price (ACP) for willingness to pay for the relative higher premium price for sustainable agro-foods; and possibility of locavore (PLO) for perceived level over the achievement of eating locally under the current structural condition. The sub-factors of subjective attributes are sensory pleasure (SEP) for providing superior taste, smell, and appearance; product quality (PRQ) for superior texture, nutritional value, freshness, and stable shelf-life; product understanding (PRU) for perceived knowledge and information about the significance and features of sustainable agro-food; and product confidence (PRC) for eco-labelled products.
We have to empower consumers by facilitating the institutional background to provoke their support and reducing external barriers to broaden consumers’ choices through policies. Therefore, three alternatives and directions of policies, including the reinforcement of certification and inspection systems, promotion of education and information, and incentive of eco-friendly and social-responsible initiatives, will be discussed.

The factors and subfactors we organized were applied as a questionnaire to collect the data from consumers in both Taiwan and France. Structurally, it was based on the matrix from the broken-down hierarchy. Following the design of age interval referred to in [45], this study regards that people aged between 18 and 65 possess the major purchasing power on fresh food goods. Moreover, another study supported this design with other threefold rationales: firstly, populations within this age range have comparatively adequate understanding of ecological related issues, and meanwhile, pay more attention to them. Secondly, they constitute the future consumers in the next decades. Thirdly, they have the potential to make the difference for the next generations and create new patterns of food consumption [14]. This survey was undertaken and collected: 100 in each case area. The age is listed on the questionnaire for filtering the profile of respondents fit in with our target ages, also used to control the similarity of every age interval, as shown in Table 4. We also asked about other demographic variables, including age, gender, education level, etc.

Additionally, the background of respondents relating with sustainable consumption was also asked as well, such as the frequency of purchasing, the involvement of eco-activities, and the acceptability of imported agro-goods. The aim was to access the quantitative data to support AHP results and conduct further study comparisons among consumers’ eco-background and socio-demographic traits.

In this study, there are 3 criteria, named “principal factors”; 11 attributes, named “sub-factors”; and 3 alternatives. The data has been used for carrying out a series of pairwise comparisons. The relative weights and rank will be measured by applying an eigenvalue method on a pairwise comparison matrix. Here, as consumers’ perception of the influence on sustainable consumption may be inconsistent, we will check the consistency ratio (CR) to make sure it is equal to or less than 0.1. After completing all the calculations at every level, we can obtain a global priority of sub-factors, also the optimal policy alternative.

Figure 1. The Analytical hierarchy process (AHP) structure for sustainable agro-food consumption.
4. Results

Based on the review of more than 60 references in Section 2, we have summarized the key factors and policy measures for sustainable food consumption which is the contribution to the literature. Through the systematic establishment of an AHP structure for sustainable agro-food consumption, two groups of survey data will be collected from respondents of France and Taiwan, then organized to conduct the calculation process of AHP. We can obtain valuable results from different analytical stages, and these semi-results can be used independently to explain and compare the current sustainable consumption in two case areas. However, the final results will be obtained through the combination of principal factors, sub-factors, and policy alternatives.

4.1. The Principal Factors

The pairwise comparisons also show the priority between three principle factors as well as their corresponding ranks. It tells us the relative importance of three groups from respondents. The results of the importance for the principal factors can be shown in Figure 2. In both Taiwan and France, the principal factor of ideological trends is the most important factor, followed by structural constraints. However, the importance of the two principal factors in Taiwan is quite different, while that in France is not. In addition, the principal factor of subjective attitudes is the lowest in the two case areas. It can be seen that under the ideological trends/social norms, health, ecology, social responsibility, and local traditional characteristics are still the main central thinking in sustainable consumption. On the other hand, it can be seen that the subjective attitudes of product sensory, quality, understanding, and trust are less valued by consumers in sustainable food consumption. In other words, sustainable food consumption patterns often care less about the quality and understanding of, and confidence regarding food, and more on the impact of the food regarding the environment, society, and regional development.

The results of considering gender and age are shown in Figure 3. It was found that more attention paid to structural constraints in Taiwan under the age of 30 may be related to the emphasis on convenience when young, while women over 30 in Taiwan pay more attention to equality of the food systems and regional characteristics, while there is no significant difference between men. This can also be observed in Table 6, and will be discussed later in detail. In France, there are structural constraints concerning product availability, price, and localization when young, and people obviously begin to pay attention to ideological trends when they are over 50. On the whole, Taiwan and France have the same age structure trends. When they are younger, people value structural constraints, but as they grow older, they pay more attention to ideological trends. However, in Taiwan, women between the ages of 30 and 50 clearly emphasize ideological trends in sustainable food consumption, which forms the main difference in results for two case areas.
areas. Although this is only a preliminary observation of principal factors, an interesting trend can be found.

![Figure 2. The global AHP importance of principal factors in Taiwan and France.](image)

If we consider the difference in marital status, the result is shown in Figure 4. There is no obvious difference in marital status in the principal factor. In Taiwan, regardless of the
marital status, the ideological trends are the main factors of sustainable food consumption. In addition, married people in Taiwan have significantly increased the importance of subjective attitudes related to quality and senses. In France, married people pay more attention to structural constraints, but it is not obvious.

Figure 4. The different marital status of principal factors in Taiwan and France.

4.2. The Sub-Factors

An overall AHP table has been calculated and shows the priority and their ranks of all the sub-factors across groups. Here, due to the data being presented in a global way, it will be valuable to see the relative importance between all the 11 sub-factors and find the top factor-sub-factor combination without group boundary. The sub-factor of availability of products (AVP) is ranked at the first place in both Taiwan and France, even considering gender differences; this factor is still one of the top three important factors for sustainable food consumption (see Table 5 for details). It is worth noting that when only principal factors are considered, the factors of ideological trends are the most important. However, AVP is a factor belonging to structural constraints. It can be seen from this that when we use AHP to explore the influence of sub-factors in the whole region, we can often find different results through the concept of stratification.

Table 5. The global AHP importance of sub-factors in Taiwan and France.

| Case Area | Sub-Factors | Total | Male | Female | Total | Male | Female |
|-----------|-------------|-------|------|--------|-------|------|--------|
|           | FHS         | 0.0791 (8) | 0.0783 (8) | 0.0808 (7) | 0.0745 (8) | 0.0671 (8) | 0.0814 (8) |
|           | ECC         | 0.0816 (7) | 0.0724 (9) | 0.0916 (6) | 0.0830 (6) | 0.0779 (6) | 0.0877 (6) |
|           | SOR         | 0.1135 (4) | 0.0976 (4) | 0.1306 (2) | 0.0868 (5) | 0.0787 (5) | 0.0943 (4) |
|           | TRR         | 0.118 (2) | 0.1027 (3) | 0.1342 (1) | 0.1352 (2) | 0.156 (1) | 0.1138 (2) |
|           | AVP         | 0.1352 (1) | 0.1513 (1) | 0.1198 (3) | 0.1439 (1) | 0.1234 (3) | 0.1619 (1) |
|           | ACP         | 0.0828 (6) | 0.0879 (7) | 0.0767 (8) | 0.1232 (3) | 0.1454 (2) | 0.1026 (3) |
|           | PLO         | 0.1137 (3) | 0.1123 (2) | 0.1153 (4) | 0.1064 (4) | 0.1224 (4) | 0.0906 (5) |
|           | SEP         | 0.1018 (5) | 0.0929 (5) | 0.1095 (5) | 0.0766 (7) | 0.0654 (9) | 0.0869 (7) |
|           | PRQ         | 0.0475 (11) | 0.0565 (10) | 0.0369 (11) | 0.0406 (11) | 0.0389 (11) | 0.0423 (11) |
|           | PRU         | 0.0698 (9) | 0.092 (5) | 0.0463 (10) | 0.0686 (9) | 0.0702 (7) | 0.0666 (10) |
|           | PRC         | 0.058 (10) | 0.056 (11) | 0.0583 (9) | 0.0636 (10) | 0.0546 (10) | 0.0719 (9) |

The bold and italic numbers are used to highlight the top 3 values.
Through Table 5, the top two factors that people in both case areas care about most in sustainable food consumption are the accessibility of products (AVP) and tradition and region (TRR), but there is a big difference in the third place. In the third important sub-factor, people in Taiwan pay more attention to the possibility of locavore (PLO) in sustainable food consumption, while French people pay more attention to the acceptance of price (ACP). The possible reason is that Taiwan is small in size, the recognition of localization belongs to the city level, and the policy and food business model is always marketing “direct delivery from the source”. However, people in Taiwan are relatively less concerned about the price of sustainable food. According to some of our interviews, this may be affected by factors such as product differentiation, universality, and positioning of sustainable food, but further verification is still needed. Other factors that are considered important in both case areas include social responsibility (SOR), which is the key driving force and value for the development of sustainable products in general. It is worth noting that in sustainable food consumption, health is not an important factor in this survey. The people of both case areas believe that the unrelated factor in purchasing sustainable food is product quality (PRQ), which may be due to the fact that the general sales channels of sustainable food already have better quality than other products.

The cross-analysis of gender and age produced many different results, as shown in Tables 6 and 7. Although the overall important factors in each age group have the same and consistent trends as the results regardless of age, there are still several important observations. First of all, from the perspective of age trends, AVP, TRR, and PLO are generally more important to sustainable food consumption factors when young, while SOR is gradually valued when older. Health factors tend to be valued gradually as people grow older, but they are not consistent. It is speculated that the middle-aged population pays more attention to health reasons in the consumption of sustainable food. In addition, the elderly persons in Taiwan attach more importance to the sensory pleasure of sustainable food. However, this is not the case in France, and young women tend to value sensory pleasure. Other special circumstances include men in Taiwan over the age of 50 valuing product understanding (PRU) and French women under the age of 18 valuing product confidence (PRC). However, there is no obvious trend in these special conditions, and further evidence is needed. PRC generally involves product certification and policy trust. This part cannot obtain high scores in the high-age groups in both case areas. Consistent with the overall analysis, the acceptability of prices is still a key factor for all age groups in France, especially men, while this phenomenon does not exist in Taiwan.

Table 6. The gender and age difference of sub-factors in Taiwan.

|       | Male | Female |
|-------|------|--------|
| Ages  | 19–30 | 31–40 | 41–50 | 51–65 | 19–30 | 31–40 | 41–50 | 51–65 |
| FHS   | 0.0788 (9) | 0.0831 (9) | 0.0981 (4) | 0.0692 (8) | 0.0567 (9) | 0.0795 (7) | 0.1095 (3) | 0.0663 (8) |
| ECC   | 0.0788 (7) | 0.0932 (7) | 0.0914 (5) | 0.1269 (1) | 0.0970 (5) | 0.1461 (2) | 0.146 (1) | 0.1224 (3) |
| SOR   | 0.1297 (2) | 0.1155 (1) | 0.0914 (5) | 0.0779 (6) | 0.0585 (8) | 0.1906 (1) | 0.1289 (2) | 0.1447 (2) |
| TRR   | 0.1525 (1) | 0.1032 (3) | 0.2168 (1) | 0.1191 (4) | 0.1839 (1) | 0.1250 (3) | 0.0999 (5) | 0.0878 (6) |
| AVP   | 0.1076 (4) | 0.1005 (6) | 0.0858 (7) | 0.0610 (10) | 0.1057 (4) | 0.0554 (8) | 0.0695 (9) | 0.0820 (7) |
| ACP   | 0.0749 (8) | 0.1013 (5) | 0.0706 (9) | 0.1241 (3) | 0.0380 (11) | 0.0331 (10) | 0.0668 (10) | 0.0397 (10) |
| PLO   | 0.0873 (6) | 0.0577 (10) | 0.0275 (11) | 0.0597 (11) | 0.0819 (7) | 0.0269 (11) | 0.0709 (8) | 0.0530 (9) |

The bold and italic numbers are used to highlight the top 3 values.
Table 7. The gender and age difference of sub-factors in France.

|        | Male          | Female        |        | Male          | Female        |        | Male          | Female        |
|--------|---------------|---------------|--------|---------------|---------------|--------|---------------|---------------|
| Ages   | 19–30         | 31–40         | 41–50  | 51–65         | 19–30         | 31–40  | 41–50         | 51–65         |
| FHS    | 0.0285 (11)   | 0.0473 (9)    | 0.1307 (2) | 0.0597 (9) | 0.0354 (11)   | 0.0269 (11) | 0.0786 (7) | 0.1642 (2)   |
| ECC    | 0.0328 (10)   | 0.0488 (8)    | 0.0909 (6) | 0.0919 (5) | 0.1024 (4)    | 0.0764 (7)  | 0.1307 (3) | 0.0704 (6)   |
| SOR    | 0.0548 (8)    | 0.0747 (5)    | 0.1154 (3) | 0.1681 (1) | 0.1619 (1)    | 0.0912 (4)  | 0.0921 (5) | 0.1123 (4)   |
| TRR    | 0.1416 (3)    | 0.2106 (2)    | 0.1154 (3) | 0.1681 (1) | 0.1619 (1)    | 0.0912 (4)  | 0.0921 (5) | 0.1123 (4)   |
| AVP    | 0.0948 (4)    | 0.2266 (1)    | 0.114 (4)  | 0.0713 (7) | 0.0709 (9)    | 0.0786 (7)  | 0.1642 (2) | 0.0704 (6)   |
| ACP    | 0.1895 (2)    | 0.1133 (3)    | 0.1583 (1) | 0.1179 (3) | 0.0791 (8)    | 0.1423 (2)  | 0.0949 (4) | 0.0962 (5)   |
| PLO    | 0.1998 (1)    | 0.0989 (4)    | 0.0994 (5) | 0.0939 (4) | 0.0862 (6)    | 0.0810 (6)  | 0.1499 (1) | 0.0503 (8)   |
| SEP    | 0.0876 (5)    | 0.0694 (6)    | 0.0513 (10)| 0.0536 (10)| 0.1263 (2)    | 0.1008 (3)  | 0.0622 (9) | 0.0657 (6)   |
| PRQ    | 0.0345 (9)    | 0.0180 (11)   | 0.0556 (9) | 0.1041 (11)| 0.0456 (10)   | 0.0336 (9)  | 0.0468 (11)| 0.0427 (10)  |
| PRU    | 0.0604 (7)    | 0.0551 (7)    | 0.0741 (7) | 0.0892 (6) | 0.083 (7)     | 0.0755 (8)  | 0.0664 (8) | 0.0467 (9)   |
| PRC    | 0.0756 (6)    | 0.0352 (10)   | 0.0418 (11)| 0.0614 (8) | 0.1225 (3)    | 0.0845 (5)  | 0.0577 (10)| 0.0334 (11)  |

The bold and italic numbers are used to highlight the top 3 values.

The analysis results of the marital status are shown in Table 8. Regardless of marital status, AVP and PLO are most important to the men in Taiwan. However, married men in Taiwan have obviously begun to pay attention to the understanding of products. Single women in Taiwan obviously pay more attention to social responsibility issues, and other parts are the same as the overall trend. Regarding the part of France, married people tend to attach importance to price factors, especially married men. In addition, health factors seem to be more important to French singles.

Table 8. The different marital status of sub-factors in Taiwan and France.

|        | Taiwan       | France       |        | Taiwan       | France       |        | Taiwan       | France       |
|--------|--------------|--------------|--------|--------------|--------------|--------|--------------|--------------|
|        | Married       | Single       | Married | Single       | Married       | Single | Married       | Single       |
| FHS    | 0.0707 (9)   | 0.0807 (7)   | 0.0937 (5) | 0.0702 (8) | 0.0431 (9)   | 0.0945 (4) | 0.0649 (10) | 0.1220 (3)   |
| ECC    | 0.1109 (5)   | 0.0556 (10)  | 0.0818 (7) | 0.0994 (6) | 0.0876 (5)   | 0.0645 (8) | 0.0839 (7)  | 0.0972 (5)   |
| SOR    | 0.0771 (7)   | 0.1075 (4)   | 0.1002 (4) | 0.1542 (1) | 0.0814 (6)   | 0.0745 (6) | 0.0949 (6)  | 0.0926 (6)   |
| TRR    | 0.0892 (6)   | 0.1085 (3)   | 0.1659 (1) | 0.1066 (5) | 0.1492 (2)   | 0.1681 (1) | 0.1082 (2)  | 0.1278 (2)   |
| AVP    | 0.1258 (1)   | 0.1619 (1)   | 0.1171 (2) | 0.1210 (3) | 0.0951 (4)   | 0.1583 (2) | 0.1743 (1)  | 0.1315 (1)   |
| ACP    | 0.0619 (10)  | 0.0995 (5)   | 0.0655 (8) | 0.0854 (7) | 0.2146 (1)   | 0.0628 (9) | 0.1020 (3)  | 0.1040 (4)   |
| PLO    | 0.1181 (2)   | 0.1093 (2)   | 0.0929 (6) | 0.1327 (2) | 0.1254 (3)   | 0.1202 (3) | 0.0980 (5)  | 0.0727 (4)   |
| SEP    | 0.1113 (4)   | 0.0847 (6)   | 0.1106 (3) | 0.1068 (4) | 0.0416 (10)  | 0.0926 (5) | 0.1004 (4)  | 0.0536 (9)   |
| PRQ    | 0.0763 (8)   | 0.0476 (11)  | 0.0423 (11)| 0.0326 (11)| 0.0341 (11)  | 0.0435 (11)| 0.0389 (11)| 0.0508 (10)  |
| PRU    | 0.1176 (3)   | 0.0807 (8)   | 0.0616 (9) | 0.0335 (10)| 0.0695 (7)   | 0.0711 (7) | 0.0670 (9)  | 0.0658 (8)   |
| PRC    | 0.0387 (11)  | 0.0636 (9)   | 0.0583 (10)| 0.0577 (9) | 0.0585 (8)   | 0.0490 (10)| 0.0676 (8)  | 0.0823 (11)  |

The bold and italic numbers are used to highlight the top 3 values.

The analysis of cognitive differences that consider the education level is shown in Figure 5. In Taiwan, there is an interesting gender difference regarding education level below high school; that is, women pay special attention to health, but men do not. In this survey, people with education levels below high school in Taiwan are also older. This apparent difference in the importance of health may also be related to the factor that the women in Taiwan usually play an important role in family care. The men in Taiwan whose education level is below a bachelor’s degree are particularly concerned about the availability of products. With the improvement of education level, the difference in the importance of the various factors of sustainable food consumption by the people in Taiwan has decreased, but it can be seen that the tradition and region (TRR) is slightly emphasized. In France, males below the high school education level pay special attention to the price factor, the bachelor education level pays more attention to the TRR, and the difference
between the master education level and above is narrowed but slightly emphasizes the price. On the other hand, women in France, regardless of their education level, pay more attention to AVP. From the analysis and observation of the educational level part, it is difficult to see consistent results. Although it can be used as a reference, it may also reflect that the level of education may have less impact than other demographic factors.

Figure 5. The different level of education for sub-factors in Taiwan and France.

4.3. Alternatives of Policy

To understand what consumers seek for change will be more meaningful because they are the ultimate target of the policy and it also provokes the possibility of transition. In this section, we will explore three possible potential policy opportunities: (1) reinforcement of certification and inspection systems (CES): rebuilding consumers’ confidence on eco-labelled agro-products; (2) promotion of education and information (EDI): creating consumers’ basic awareness and understanding, and eliminating potential asymmetric information and ambiguity; and (3) incentive of eco-friendly and social-responsible initiatives (ESI): reinforcing the ecological components, social welfare, and equality for future development and technology of agricultural and food processed sectors. The results of the overall analysis of the policy alternatives of the two case areas can be referred to as shown in Figure 6. The AHP analysis is based on the 11 important sub-factors of sustainable food consumption and is the result of a pairwise comparative analysis of the three policy alternatives. In Taiwan, the three policy alternatives received similar grades. In France, education and information is the highest, followed by certification and inspection systems. In addition, without using the AHP method, this survey also directly asked consumers what the most important policy direction is. Without AHP, the “education and information” was ranked as the first important alternative in both Taiwan and France. This direct ranking is consistent with AHP results in the French case. However, in the case of Taiwan, the “education and information” was the last one in the AHP result but the first one in direct ranking. It responds to the slight difference between the three policy alternatives of the AHP result, but the three alternatives can be considered as equally important in the case of Taiwan. At the same time, the AHP analysis method should be regarded as a more systematic objective analysis result that excludes subjective factors.
Figure 6. The importance of policy alternatives in Taiwan and France.

In terms of policies and measures to promote sustainable food consumption, if we consider gender and age differences, we can refer to the analysis shown in Figure 7. We can see that the women in Taiwan aged 31–40 can produce the best results with the certification and inspection systems, while women aged 51–65 have a better promotion effect on eco-friendly and socially responsible initiatives. However, the analysis of policy alternatives does not have consistent results and trends in the distribution of gender and age in Taiwan. The trend of policy alternatives is obvious in the age distribution of France. Young people in France have a better effect on and acceptance of certification and inspection systems, and the use of education and information can bring more obvious impetus to the sustainable food consumption of older people. In the part about gender differences in France, it can be found that women are more concerned about education and information-related policy measures than men.

In summary, although Taiwan’s ESI measure ranks first, there is no significant difference in overall weight compared with other measures. Through the cross-analysis of age and gender, we can also find that CES and EDI-related measures are still the most effective strategy to promote sustainable food consumption, regardless of whether in Taiwan or France. On the whole, people believe in certification-related mechanisms more when younger and need more understanding of products when older.
5. Discussion

With eco-awareness growing, sustainable food consumption has received greater attention worldwide. The consumption rate of organic food and other sustainable food products is surging. Therefore, the challenge is how to accelerate this movement and generalize it to be attained in every corner of the world because maintaining sustainable food chains requires a global effort. This study is here to discuss the key components of a sustainable food consumption, then evaluate them from the local consumers’ perspectives, which are the final decision-makers for transforming their diet habits. Thus, personal value and perceived cognitions are extremely important from this point of view. Once buyers have an adequate understanding and knowledge towards sustainable foods or certification systems, it will increase their confidence in this genre of products. As previous studies have repeatedly stressed, consumers’ positive attitudes over sustainable food products can be created through gathering information and trust.

Cross-cultural comparison is an essential element in our study; it shows the different development of the case areas and may be used as a blueprint for further investigations. However, when comparing two areas, the macro and structural factors must be considered because these are the elements that establish the society and shape the dissimilarities. The two factors interrelated and interconnected with each other, such as different agricultural contexts, vary people’s diet habits and issues concerning them. Nevertheless, to find people’s needs from a sustainable consumption standpoint is the ultimate goal. Once the future policy implications can fulfil citizens’ real demands, it will be more efficient and favorable to facilitate a diet transition.

In this study, the three principal factors and their corresponding sub-factors as well as the three policy opportunities were found and organized from two parts: cross-cultural comparisons on sustainable consumption and consumer study on sustainable foods. First, through a large amount of literature collection and comparison, we have identified 11 key sustainable food consumption factors. Each element was well defined according to the bibliography for the purpose of our survey step. They are a part of the contribution from this study, and also the materials for estimations. In addition, survey data from
socio-demographic parts were originally designed to provide convincing support and explanations for AHP results, and a great number of comparisons can be established to obtain the information from different prospects.

The results of AHP’s comprehensive analysis brought some important messages. For the principal factor, the factor of ideological trends is the most important consideration in both Taiwan and France, indicating that the importance of its sub-factors has also relatively increased. The importance of ideological trends mainly comes from the TRE and SOR related to personal values, public opinion, and society. Ideological trends are mainly recognized by female respondents in the survey distribution in Taiwan, while in France, they are mostly affected by the recognition of older people. For the sub-factors, the most important thing for both case areas is product accessibility, which is more valued by the public than TRR in sustainable food consumption. In addition, it can be found that health is relatively less important in the consumption of sustainable food. Considering the part of age analysis, social responsibility is gradually being valued with age. The health factor is that middle-aged people pay more attention to it than elderly people. The age groups in both case areas do not value product confidence related to product certification. In addition, almost all age groups in France attach importance to the price factor, especially men who are married or have an education level below high school. On the other hand, married men in Taiwan attach importance to product knowledge. For the policy alternatives, the three alternatives are equally important, while education and information is the highest in France. In terms of age analysis, France can strengthen the certification and inspection system for young people, which will have a better acceptance, while for the elderly, it is suitable to use education and information as the basis for the promotion of sustainable food consumption.

In summary, the two practices of sustainable food’s information understanding and certification system are important to both case areas at different levels. We can use public influence to share information effectively (i.e., social media, social networks) to raise the acceptability of eco-products and willingness to change lifestyles while enhancing eco-labels and inspection systems. Through increasing consumers’ awareness and their personal understandings, we can reinforce positive personal values and build confidence to decrease structural limitations, information asymmetric, and ambiguous.

6. Conclusions

Through the literature review and analysis of this research, we put forward the following main contributions and conclusions. First, we refer to more than 60 references on the important factors of sustainable food consumption and the possible culture conditions of different case areas. We have defined 11 important sustainable food consumption factors and classified them into three key factor categories. In addition, according to important sustainable food promotion measures, the policies are summarized into three alternatives as the basis for analysis and comparison. The above review and the compilation of sustainable food consumption factors are the first contribution of this research, which are the contributions to the literature. Second, we have used the AHP method to conduct a large number of surveys in two case areas with different culture conditions, and reduce subjective biases through pairwise comparisons. Third, the case studies of Taiwan and France are compared, and the common general direction and different details for sustainable food consumption factors are derived. The observations are organized as follows:

Similar sustainable food consumption factors and trends in the two case areas are listed below:

(1) The primal factor of ideological trends is the most important factor, mainly from tradition and region, and social responsibility.
(2) People value structural constraints when they are young, but as they grow older, they pay more attention to ideological trends.
(3) The availability of products is the most important sub-factor related to the accessibility of products and convenience.
(4) Product quality and product confidence are the least valued factors in sustainable food consumption.
(5) The importance of health is not significant in sustainable food consumption.
(6) Elderly people pay more attention to social responsibility.
(7) In terms of policy, education and information, certification and inspection systems are the most widely accepted and effective measures to promote sustainable food consumption.

The different considerations of sustainable food consumption in the two case areas include:

(1) Women in Taiwan and the elderly persons in France are more concerned about ideological trends related to the inherent trends and abilities of society.
(2) Compared with Taiwan, France is more concerned about prices in terms of sustainable food consumption. The main reason comes from the perception of men.
(3) Old and married people in Taiwan and young French women pay more attention to the taste, smell, and appearance of sustainable food.
(4) The people in Taiwan with an education level below high school are relatively older, and women are more concerned about health, while men are not at all.
(5) In terms of policy, France has a trend that younger ethnic groups are more accepting of the certification system, while older ethnic groups are more in need of information. Taiwan has no such trend.

For the future studies, although this study analyzes the sustainable consumption factors of Taiwan and France through surveys and AHP numerical analysis, the reasons behind the formation of the data can still be further verified through the continuous attention of social science. After understanding consumer factors, the drive of a sustainable food supply chain should return to the production side for thinking by considering the environment and consumer needs together. Once the future policy implications and food supply can fulfill citizens’ real demands, it will be more efficient and favorable to facilitate diet transition.

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