Article

Factors Affecting Consumers' Purchasing of Suboptimal Foods during the COVID-19 Pandemic

Chun Yang [1] and Xuqi Chen [2,*]

1   School of Design, Jiangnan University, Wuxi 214122, China; 8202201014@jiangnan.edu.cn
2   Department of Agricultural and Resource Economics, University of Tennessee, Knoxville, TN 37996, USA
*   Correspondence: xchen88@utk.edu

Abstract: Since the outbreak of the COVID-19 pandemic, global food production and transportation have been largely impacted. Meanwhile, consumers have purchased and stockpiled large quantities of foods due to panic in the early stage of the pandemic, which has resulted in a lot of uneaten, expired foods and has reduced the varieties of foods available in the markets. Due to the lower prices, some consumers have chosen to buy those foods with an earlier production time or inferior quality (suboptimal foods), and the purchase rate of suboptimal foods has increased. Therefore, this study investigated consumer behavior during the pandemic as the research focus, explored the main dimensions that affect consumers' purchasing of suboptimal foods during the COVID-19 pandemic, tested their correlations, and proposed suggestions for improvement. The results of this study showed that the impacts of Perceived Benefits on Attitude Toward Behavior, Perceived Behavioral Control, and Subject Norm rank 1st, 2nd, and 3rd in importance, respectively, which are all higher than the related impact of Environmental Concerns. For consumers, the most important thing is whether suboptimal foods have consumption motivation for them, which is also the most direct way to make consumers feel the value of suboptimal foods. Furthermore, for consumers, while the environmentally friendly attributes of suboptimal foods are less perceptible than the economic motivations, they still have considerable influence on consumers, and this is even more prominent during the COVID-19 pandemic. Many families have experienced a shock to their income during the pandemic, and consumers are more sensitive and concerned about commodity prices, which also makes lower-priced and more abundant suboptimal foods more popular. However, in the long term, suboptimal foods can have a positive impact on reducing food waste and protecting the environment. When consumers realize this, they will be more motivated to purchase and try suboptimal foods.

Keywords: suboptimal foods; COVID-19; environmental concerns; perceived benefits; TPB

1. Introduction

1.1. Research Background and Motives

Food is one of the fundamentals on which human survival depends, and food waste caused by the supply chain and post-consumerism have always existed [1]. According to the Food and Agriculture Organization of the United Nations (FAO), 1/3 of the world's food (about 1.3 billion tons) is wasted or discarded every year, which is valued up to USD 998 billion [2]. With such a significant amount of food waste, numerous regions of the world are still suffering serious food crises. The United Nations (UN) stated in the Report of the Secretary-General: Progress toward the Sustainable Development Goals issued on 19 May 2020: Since 2015, millions of children are still malnourished in the world, and an additional 370 million primary school students lack free school meals [3]. Therefore, how to reduce food waste has become a global issue and the key to achieving global sustainable development [4].

One important reason for food waste is that consumers are unwilling to purchase suboptimal food [5], and usually choose optimal foods as their first choice [6]. For consumers,

relevant studies on factors affecting their choice of suboptimal foods show that, compared with optimal foods, if all other conditions are the same, only a small number of consumers will choose suboptimal foods in stores [7,8]. This seems to be reasonable and wise because suboptimal foods will still be considered to have fewer benefits than optimal products in some aspects of the product, even if they are the same in food safety or intrinsic quality. Therefore, consumers usually choose optimal foods as their first choice [6]. In order to avoid the suboptimal foods, consumers can often choose other brands of optimal foods if the first choice is not available. In the Chinese market, people started to pay attention to the suboptimal foods relatively late. It was not until 2012 that China's State Administration for Industry and Commerce issued a document requiring food manufacturers to conspicuously mark the food that was about to expire, and consumers' stereotype of suboptimal foods also prevented the purchase of suboptimal foods, and mostly led to food waste [9]. However, since the COVID-19 pandemic [10], the food production and consumption system has undergone tremendous changes [11]. The COVID-19 pandemic has affected the global food system and brought a lot of changes [12]. The suspension of food production and transportation due to the COVID-19 pandemic and the massive purchase and stockpiling of food due to panic in the early stage of the pandemic resulted in a considerable amount of uneaten but expired food being wasted by consumers [13]. Stockpiling can also lead to disruption of the food system, such as shortages, rising food prices, uneven distribution of food, disruption of the food supply chain, and food waste [14]. Suboptimal foods, as a nonpreferred option, may be considered by consumers in this situation to supplement the shortage of food and alleviate the situation.

If consumers can still choose and accept suboptimal foods in the middle and late stages of the pandemic, as well as after the pandemic, the food waste during production, storage, and transportation can be effectively reduced. Therefore, this study took consumers during the pandemic as the research subject, explored the main dimensions that affect consumers' purchasing of suboptimal foods during the COVID-19 pandemic, and tested their correlations. Then, improvement suggestions were proposed for the reference of the government, industry, consumers, and other relevant entities.

1.2. Suboptimal Foods

Suboptimal foods have the appearance of aesthetic defects [15], which are generally divided into (1) appearance standards (shape, size, and weight) deviating from the normal size or optimal products [16]; (2) expiry date (close to or beyond the optimal taste time); (3) packaging (breakage, dents, etc.) [17]; however, the product quality and safety of suboptimal foods are not different from those of optimal foods [18].

As COVID-19 is extremely contagious [19], at the beginning of the pandemic, people were forced to stay at home due to government bans [20], and a large number of foods and daily necessities in the supermarket were quickly sold out. In addition, the supply chains across cities, provinces, and nations were interrupted [21]. As a result, the suboptimal products of some supermarkets have also become consumers' purchase choices. To ensure people's livelihood, local manufacturers still have to maintain the supply of local products, including food, fruits, vegetables, meat, and other living necessities [22]. Although they may not be at their best taste, they can still meet emergency and living needs. In the middle and late stages of the pandemic, most countries have already taken certain measures to deal with the virus [23], production in many areas has gradually recovered, and consumers' lives have gradually returned to normal, which has once again lowered the motivations of purchasing suboptimal foods.

In addition, suboptimal foods can be used in restaurants and takeaways, as they are not directly contacted by consumers. Restaurants usually consider the priority of buying and using relatively suboptimal foods, or foods that have been produced for a longer time. Usually, the prices of suboptimal foods are lower [24], which will reduce restaurant costs.

2. Relevant Studies

2.1. Environmental Concerns

Environmental Concerns (EC) refer to an individual's perception of environmental issues or a strong attitude or willingness to protect the environment [25], and can also be interpreted as an individual's awareness of environmental issues and support [26]. Environmental Concerns are generally used to predict environmental awareness behaviors. The results of international public surveys show that, due to the increasing degradation of the global environment [27], the public has maintained high attention to environmental issues, and most people regard environmental protection as one of their important personal goals [28]. Environmental Concerns will affect consumer value and consumer choices [29], while consumers' subjective environmental awareness and concerns about the environment will affect their choice to purchase green products [30]. The research of Stangherlin et al. showed that there is a positive correlation between consumer concerns about the environment and their purchase intention of suboptimal foods [31]. Makhal et al. found that those consumers, with children, have a stronger awareness and concern about food waste, and they are more inclined to choose suboptimal foods [32]. Aschemann-Witzel et al. found that word of mouth of the benefits of suboptimal foods for environmental protection and the reduction in food waste can stimulate purchase [33]. Therefore, associating suboptimal foods with sustainable development may also become one of the motivations for consumers to purchase suboptimal foods.

As part of the environmental issues, food waste is related to Environmental Concerns [34]. It is generally believed that consumers with higher Environmental Concerns tend to pay more attention to environmental protection in their attitudes and behaviors [35]. In other words, when Environmental Concerns are higher, consumers are less likely to waste their foods and are more likely to purchase suboptimal foods, which are more environmentally friendly.

2.2. Perceived Benefits

Perceived Benefits (PB) refer to the perceived possibility of positive results after consumers make their decisions [36] and are a perceived emotion that has a positive influence on consumers' decision-making and behaviors [37]. Consumers' perceived benefits can be divided into economic and noneconomic aspects [38]. From the noneconomic aspect, in the food field, taste [39] and vision [40] are the most direct benefits for consumers from foods, which are called hedonism in the perceived benefits. The functional attributes of foods (including nutritional value, medical value, etc.) are easily perceived by consumers, which is called utilitarian in the perceived benefits [39]. From an economic perspective, suboptimal foods usually have a price advantage (price discount), as compared with general foods [8]. When the prices of suboptimal foods are lower than general foods to a certain extent, consumers will be willing to pay, which is also one of the means for sellers to attract consumers [41].

2.3. Theory of Planned Behavior (TPB)

The Theory of Planned Behavior (TPB) was proposed by Ajzen based on the Theory of Reasoned Action (TRA) [42]. According to Ajzen, male or female behavioral intention is affected by way of three dimensions—Attitude Toward Behavior, Subject Norm, and Perceived Behavioral Control [43,44]. TPB has been widely proven and used to examine personal behavior in various fields, including the food field [45–49]. Therefore, it is considered that TPB is suitable for studying the dimensions affecting consumers' purchasing of suboptimal foods during the COVID-19 pandemic.

In TPB, the actual behavior of an individual is determined by their behavioral intention, meaning behavioral intention determines the willingness of an individual to participate in a specific behavior [44]. The attitude in TPB refers to the inner attitude of an individual toward the behavioral intention. Subject Norm refers to the expected social pressure of an individual, as perceived during the performance of a certain behavior [44,50,51]. Perceived

Behavioral Control refers to the difficulties that an individual perceives when engaging in a certain behavior [50,51].

3. Research Method and Hypothesis

3.1. Research Process and Setting

The purpose of this study was to explore the factors that influence consumers' purchasing of suboptimal foods during the COVID-19 pandemic. In order to explore the relationship between each different dimension, this study used structural equation modeling (SEM) for data analysis, and established the research framework and process, including the following: 1. A literature review and discussion were conducted to revise the research results of previous scholars to construct the theoretical framework of this study, and to establish statistical hypotheses for each dimension; 2. Based on the theoretical framework of relevant factors influencing consumers' purchasing of suboptimal foods during COVID-19 pandemic, a questionnaire design and survey were carried out, and questionnaire reliability was analyzed; 3. According to the theoretical framework of this study, a research model was established, and CFA, convergence validity, and discriminant validity were used to verify the fitness of the model; 4. Analysis and structural equation modeling were used to verify the validity of the statistical hypothesis among all dimensions and find out the relevant factors influencing consumers' purchasing of suboptimal food during the COVID-19 pandemic.

3.2. Proposed Theoretical Model

This study adopted structural equation modeling (SEM) as the research method. Based on the literature discussed in Section 2, TPB [42] was used as the basic model to construct the research model. Environmental Concerns were then added as a variable to TPB, in order to study the attitudes of consumers toward the environment, which is also confirmed by Ajzen [52]. Perceived Benefits were used as a measure of the perceived value of suboptimal foods by consumers [37]. Thus, they were also added to the TPB model. In order to find out which factors, Environmental Concerns or Perceived Benefits, affect TPB, this study assumed that Environmental Concerns and Perceived Benefits have a positive impact on the four factors of TPB, which was tested in the subsequent analysis. The structural equation model has been proven to be suitable for food issues [53]; therefore, the research framework of this study is as shown in Figure 1.
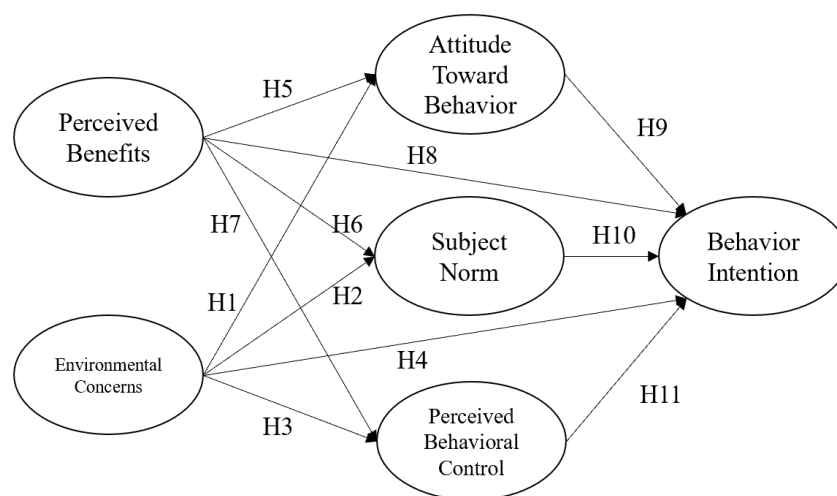
Figure 1. Research structure.

3.3. Research Hypothesis

Based on the previous discussion, 11 research hypotheses regarding the dimensions affecting consumers' purchasing of suboptimal foods are proposed in this study:

Hypothesis 1 (H1). *There is a significant positive correlation between Environmental Concerns and consumers' attitudes toward purchasing suboptimal foods.*

Hypothesis 2 (H2). *There is a significant positive correlation between Environmental Concerns and consumers' subject norms for purchasing suboptimal foods.*

Hypothesis 3 (H3). *There is a significant positive correlation between Environmental Concerns and consumers' perceived behavioral control of purchasing suboptimal foods.*

Hypothesis 4 (H4). *There is a significant positive correlation between Environmental Concerns and consumers' behavioral intention of purchasing suboptimal foods.*

Hypothesis 5 (H5). *There is a significant positive correlation between Perceived Benefits and consumers' attitudes toward purchasing suboptimal foods.*

Hypothesis 6 (H6). *There is a significant negative correlation between Perceived Benefits and consumers' subject norms for purchasing suboptimal foods.*

Hypothesis 7 (H7). *There is a significant negative correlation between Perceived Benefits and consumers' perceived behavioral control of purchasing suboptimal foods.*

Hypothesis 8 (H8). *There is a significant positive correlation between Perceived Benefits and consumers' behavioral intention of purchasing suboptimal foods.*

Hypothesis 9 (H9). *There is a significant positive correlation between consumers' attitudes and behavioral intention of purchasing suboptimal foods.*

Hypothesis 10 (H10). *There is a significant positive correlation between subject norms and consumers' behavioral intention of purchasing suboptimal foods.*

Hypothesis 11 (H11). *There is a significant positive correlation between perceived behavioral control and consumers' behavioral intention of purchasing suboptimal foods.*

3.4. Definition and Measure of the Variables

In this study, the theoretical framework of the dimensions that affect consumers' purchasing of suboptimal foods under the COVID-19 pandemic is divided into six dimensions: Environmental Concerns, Perceived Benefits, Attitude Toward Behavior, Subject Norm, Perceived Behavioral Control, and Behavioral Intention. Based on the research topic, and with reference to related literature, the questionnaire was designed. The definitions of variable operability and the reference of the scale are shown in Table 1.

Table 1. Definition of variable operability and reference scales.

Research Variable	Operability Definition	Item	Questions	Reference Scale
Attitude Toward Behavior	Refers to the actual attitude and evaluation of an individual toward purchasing suboptimal foods.	ATB1	I think in the current pandemic, purchasing ugly fruit and vegetables has a positive impact on environmental protection.	[44,50,51]
		ATB2	I think in the current pandemic, purchasing ugly fruit and vegetables can help solve the problems of life.	
		ATB3	I think it's wise to purchase ugly fruit and vegetables.	
		ATB4	I am willing to reduce the damage to the environment through my own actions.	

Table 1. *Cont.*

Research Variable	Operability Definition	Item	Questions	Reference Scale
Subject Norm	Refers to the standardization of the important reference subject to the individual in the purchase of suboptimal foods.	SN1	What my family, friends, and colleagues think about purchasing ugly fruit and vegetables is important to me.	[44,50,51]
		SN2	I will change my behavior by listening to my influential family, friends, and colleagues about purchasing ugly fruit and vegetables.	
		SN3	The mass media, government policies, online information, expert opinions, and salespeople's views on purchasing ugly fruit and vegetables are important to me.	
		SN4	I will change my behavior by listening to the influential mass media, government policies, online information, expert opinions, and salespeople's views on purchasing ugly fruit and vegetables.	
Perceived Behavioral Control	Refers to the intentions of an individual to purchase suboptimal foods under subjective judgment.	PBC1	It's entirely up to me to purchase ugly fruit and vegetables.	[44,50,51]
		PBC2	For me, I would buy ugly fruit and vegetables even if they have a slightly inferior taste.	
		PBC3	My influential family, friends, and colleagues can affect whether I purchase ugly fruit and vegetables.	
		PBC4	I know enough about ugly fruit and vegetables.	
Perceived Benefits	Refers to the perceived possibility of a positive result after an individual purchases suboptimal foods.	PB1	Ugly fruit and vegetables have an advantage over optimal foods because of lower prices.	[54,55]
		PB2	Ugly fruit and vegetables have an advantage over optimal foods because they have not been sprayed with pesticides.	
		PB3	Ugly fruit and vegetables are comparable in taste to optimal foods.	
		PB4	Ugly fruit and vegetables are more readily available than optimal foods.	
Environmental Concerns	Refers to the perception or concern of an individual about environmental issues.	EC1	Human beings are seriously abusing the environment and the garbage problem is becoming more and more serious.	[56,57]
		EC2	Human beings must live in harmony with nature for their own future.	
		EC3	I am worried about the state of the world environment and its impact on my future.	
		EC4	Environmental problems have affected my life.	
Behavioral intention	Refers to the possibility that an individual will purchase suboptimal foods at a future time point.	BI1	I think in the current pandemic, purchasing ugly fruit and vegetables has a positive impact on environmental protection.	[44,50,51]
		BI2	I think in the current pandemic, purchasing ugly fruit and vegetables can help solve the problems of life.	
		BI3	I think it's wise to purchase ugly fruit and vegetables.	
		BI4	I am willing to reduce the damage to the environment through my own actions.	
		BI5	What my family, friends, and colleagues think about purchasing ugly fruit and vegetables is important to me.	

4. Research Analysis and Results

4.1. Descriptive Analysis of Demographic Variables

In order to confirm the quality and credibility of the questionnaire, online questionnaires were distributed from May to July in 2020. The respondents of the questionnaire were Chinese consumers. Online questionnaires in Chinese were distributed through the "Credamo" platform. All the respondents clicked on the web link to view the survey description of this study. At the same time, the respondents volunteered to answer the research questions and could withdraw from this study at any time. Therefore, all the

respondents agreed to participate in this study under the principle of fully informed and voluntary participation. After completing the questionnaire, the respondents would receive CYN 15 in compensation and also participated in the platform lottery activity as gratitude for their answers.

In addition to demographic variables, the 7-point Likert scale (1, Strongly disagree−7, Strongly agree) was used. Finally, 377 samples were collected in this study. After excluding invalid samples (logical errors or too many identical options), 323 samples were left, which met Jackson's standard that the ratio of estimated parameters to sample size should be higher than 1:10 [58]. According to the data of respondents in valid questionnaires, the distribution of demographic variables in this study is shown in Table 2.

Table 2. Table for sample basic data.

Sample	Item	Frequency (n = 323)	Percentage (%)
Gender	Male	144	44.58
	Female	179	55.42
Age	Under 30	115	35.60
	31–40	120	37.15
	41–50	68	21.05
	Above 51	20	6.19
Marital status	Single	36	11.15
	Married	93	28.79
Income (RMB)	Under 4000	84	26.01
	4001–6000	67	20.74
	6001–12,000	32	9.91
	12,001–18,000	11	3.41
	Above 18,001	33	10.22
Education	Middle school and below	144	44.58
	High school or technical secondary school	90	27.86
	Undergraduate or junior college	125	38.70
	Graduate and above	75	23.22
Occupation	Manufacturing	246	76.16
	Medical care	77	23.84
	Finance	53	16.41
	Design	51	15.79
	Services	65	20.12
	Others	76	23.53

Data source: Compiled by this study.

4.2. Convergent Validity and Discriminant Validity

In this study, the questionnaire was used by Cronbach's α coefficients. As shown in Table 3, the reliability coefficient did not increase significantly after the questions were deleted, and the Cronbach's α coefficients of reliability were all higher than 0.8. Therefore, the internal consistency of the questionnaire data in this study was high, which can be further analyzed.

After the liability and validity tests, confirmatory factor analysis was conducted in this study to test factor loading, reliability, convergence validity, and discriminant validity [59]. According to the studies on convergence validity by Hair et al. [60], Nunnally and Bernstein [61], and Fornell and Larcker [62], as well as the studies by Chin [63] and Hooper et al. [64], the standardized factor loadings of this study were higher than 0.7, the composite reliability of the research dimension was higher than 0.7, and the AVE was higher than 0.5 [60], indicating that the dimension had good convergence validity.

Table 3. Measurement model.

Dimension	Item	Cronbach's α	Unstd.	S.E.	Unstd./S.E.	*p*-Value	Std.	CR	CV
Attitude Toward Behavior Cronbach's α = 0.882	ATB1	0.854	1.000				0.808	0.887	0.665
	ATB2	0.829	1.097	0.062	17.798	0.000	0.858		
	ATB3	0.818	1.102	0.060	18.369	0.000	0.879		
	ATB4	0.888	0.869	0.064	13.564	0.000	0.699		
Subject Norm Cronbach's α = 0.929	SN1	0.931	1.000				0.797	0.931	0.772
	SN2	0.895	1.140	0.060	19.079	0.000	0.898		
	SN3	0.901	1.157	0.059	19.467	0.000	0.911		
	SN4	0.903	1.136	0.059	19.207	0.000	0.902		
Perceived Behavioral Control Cronbach's α = 0.871	PBC1	0.875	1.000				0.687	0.876	0.640
	PBC2	0.821	1.275	0.095	13.371	0.000	0.827		
	PBC3	0.817	1.249	0.091	13.675	0.000	0.850		
	PBC4	0.826	1.218	0.092	13.272	0.000	0.820		
Perceived Benefits Cronbach's α = 0.904	PB1	0.887	1.000				0.814	0.904	0.703
	PB2	0.864	1.096	0.060	18.160	0.000	0.865		
	PB3	0.872	1.013	0.058	17.492	0.000	0.841		
	PB4	0.877	1.034	0.060	17.203	0.000	0.831		
Environmental Concerns Cronbach's α = 0.925	EC1	0.907	1.000				0.853	0.926	0.759
	EC2	0.894	1.100	0.051	21.449	0.000	0.896		
	EC3	0.891	1.021	0.047	21.620	0.000	0.900		
	EC4	0.917	0.957	0.051	18.896	0.000	0.833		
Behavior Intention Cronbach's α = 0.933	BI1	0.921	1.000				0.841	0.934	0.739
	BI2	0.921	1.010	0.053	19.186	0.000	0.847		
	BI3	0.913	1.115	0.053	20.904	0.000	0.890		
	BI4	0.922	1.117	0.058	19.120	0.000	0.845		
	BI5	0.912	1.059	0.052	20.215	0.000	0.873		

Unstd. = Unstandardized factor loadings, Std = Standardized factor loadings, CR = Composite Reliability, CV = Convergence Validity.

Discriminant validity was based on the research of Fornell and Larcker [62]. If the square root of AVE is greater than the correlation coefficient between the dimensions, the model has discriminant validity. According to the results, the data in this study had good discriminant validity (Table 4).

Table 4. Discriminant validity for the measurement model.

	AVE	ATB	SN	PBC	PB	EC	BI
ATB	0.665	**0.815**					
SN	0.772	0.626	**0.878**				
PBC	0.640	0.694	0.618	**0.800**			
PB	0.703	0.672	0.615	0.635	**0.838**		
EC	0.759	0.569	0.584	0.572	0.523	**0.871**	
BI	0.739	0.709	0.679	0.700	0.666	0.580	**0.859**

Note: The items on the diagonal in bold represent the square roots of the AVE; off-diagonal elements are the correlation estimates.

4.3. Structural Model Fit Text

Based on the research of Jackson et al. [65], Kline [66], Schumacker [67], and Hu and Bentler [68], multiple indicators were used to evaluate the fit of the structural model. As shown in Table 5, all measurement results were in line with the fit index, indicating that the model had a good goodness of fit.

4.4. Path Analysis

Table 6 shows the path analysis results. Attitude Toward Behavior (ATB) (b = 0.335, *p* < 0.001), Subject Norm (SN) (b = 0.253, *p* < 0.001), and Perceived Behavioral Control (PBC) (b = 0.400, *p* < 0.001) had significant impacts on Behavioral Intention (BI). Perceived Benefits (PB) (b = 0.622, *p* < 0.001) and Environmental Concerns (EC) (b = 0.213, *p* < 0.001) had significant impacts on Attitude Toward Behavior (ATB). Perceived Benefits (PB) (b = 0.478, *p* < 0.001) and Environmental Concerns (EC) (b = 0.326, *p* < 0.001) had significant impacts on Subject Norm (SN). Perceived Benefits (PB) (b = 0.486, *p* < 0.001) and Environmental Concerns (EC) (b = 0.217, *p* < 0.001) had significant impacts on Perceived Behavioral Control

(PBC). In terms of explanatory power, the explanatory power of Attitude Toward Behavior, Subject Norm, Perceived Behavioral Control, Perceived Benefits, and Environmental Concerns to Behavioral Intention was 71.2%. The explanatory power of Perceived Benefits and Environmental Concerns to Attitude Toward Behavior was 64.3%. The explanatory power of Perceived Benefits and Environmental Concerns to Subject Norm was 55.2%. The explanatory power of Perceived Benefits and Environmental Concerns to Perceived Behavioral Control was 60%.

Table 5. Evaluation results.

Indicators	Norm	Results	Judgment
ML chi-square (MLχ^2)	The small the better	772.611	-
Degrees of Freedom (DF)	The large the better	260.000	-
Normed Chi-square (χ^2/DF)	$1 < \chi^2/DF < 5$	2.972	Yes
Root-Mean-Square-Error Approximation (RMSEA)	<0.08	0.078	Yes
Standardized Root-Mean-Square Residual (SRMR)	<0.08	0.050	Yes
Tucker–Lewis Index (TLI)	>0.9	0.918	Yes
Comparative Fit Index (CFI)	>0.9	0.929	Yes
Normative Fit Index (NFI)	>0.9	0.897	No
Goodness-of-Fit Index (GFI)	>0.8	0.924	Yes
Parsimony Goodness-of-Fit Index (PGFI)	>0.5	0.659	Yes
Parsimony Normed Fit Index (PNFI)	>0.5	0.777	Yes
Incremental Fit Index (IFI)	>0.9	0.929	Yes

Table 6. Regression coefficient.

Hypothesis	DV	IV	Unstd.	S.E.	Unstd./S.E.	*p*-Value	Std.	R^2	Results
H9		ATB	0.335	0.055	6.044	0.000	0.349		Not reject
H10		SN	0.253	0.048	5.230	0.000	0.271		Not reject
H11	BI	PBC	0.400	0.066	6.031	0.000	0.360	0.712	Not reject
H8		PB	0.138	0.082	1.687	0.092	0.148		Reject
H4		EC	0.048	1.313	0.189	0.073	0.048		Reject
H5	ATB	PB	0.622	0.061	10.187	0.000	0.646	0.643	Not reject
H1		EC	0.213	0.047	4.544	0.000	0.242		Not reject
H6	SN	PB	0.478	0.060	7.969	0.000	0.482	0.552	Not reject
H2		EC	0.326	0.051	6.322	0.000	0.359		Not reject
H7	PBC	PB	0.486	0.057	8.568	0.000	0.584	0.600	Not reject
H3		EC	0.217	0.044	4.958	0.000	0.285		Not reject

4.5. Hypothesis Explanation

The purpose of this study was to use the structural equation model to determine the dimensions that affect consumers' purchasing of suboptimal foods under the COVID-19 pandemic, and thus to form the research strategy, which can serve as a reference for relevant organizations.

Figure 2 shows the path coefficients. The greater the coefficient, the greater the impact. Black lines represent an impact (hypothesis is not rejected), while red lines represent no impact (hypothesis is rejected).
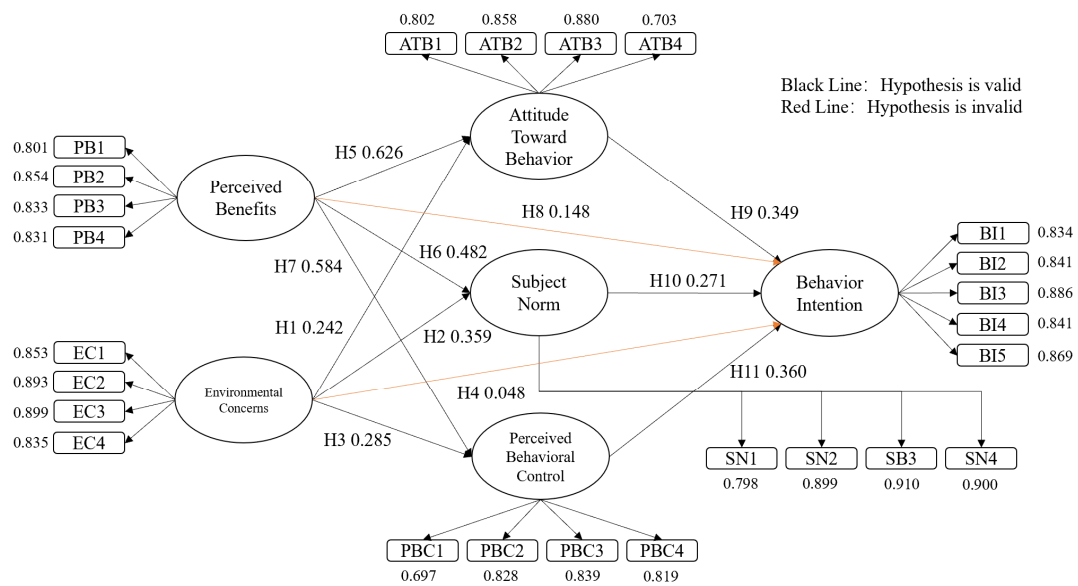
Figure 2. Research structure pattern diagram.

4.6. Discussion

The empirical analysis results provide some key findings, which are discussed as follows:

H1 is not rejected, which means that the Environmental Concerns of consumers have a significant positive correlation with the attitude toward purchasing suboptimal foods under the COVID-19 pandemic. H2 is not rejected, which means that the Environmental Concerns of consumers have a significant positive correlation with the subject norm of purchasing suboptimal foods under the COVID-19 pandemic. H3 is not rejected, which means that the Environmental Concerns of consumers have a significant positive correlation with the Perceived Behavioral Control of purchasing suboptimal foods under the COVID-19 pandemic. H4 is rejected, which means that the Environmental Concerns of consumers are not correlated with the behavioral intention of purchasing suboptimal foods under the COVID-19 pandemic. The above hypothesis verification proves that Environmental Concerns have an impact on TPB [42,44] and will not directly affect BI, but through Attitude Toward Behavior, Subject Norm, and Perceived Behavioral Control. Consumers' environmental awareness and perception will affect their intention of purchasing suboptimal foods. During the pandemic and after, if consumers realize that suboptimal foods are environmentally friendly, they will choose to purchase suboptimal foods and recommend suboptimal foods to their relatives and friends. Moreover, consumers' self-ethical condemnation due to food waste [69] will also become a reason to purchase suboptimal foods. As a frequently mentioned topic, environmental issues have been affecting many consumers' environmental behaviors, including whether to purchase suboptimal foods. The pandemic may have made some consumers more concerned about survival. However, from the data results, consumers have not ignored the environmentally friendly benefits of purchasing suboptimal foods. Perhaps consumers know that environmental problems may take longer to deal with and solve than the COVID-19 pandemic.

H5 is not rejected, which means that the Perceived Benefits of consumers have a significant positive correlation with the attitude toward purchasing suboptimal foods under the COVID-19 pandemic. H6 is not rejected, which means that the Perceived Benefits of consumers have a significant positive correlation with the subject norm of purchasing suboptimal foods under the COVID-19 pandemic. H7 is not rejected, which means that the Perceived Benefits of consumers have a significant positive correlation with the Perceived Behavioral Control of purchasing suboptimal foods under the COVID-19 pandemic. H8 is rejected, which means that the Perceived Benefits of consumers are not correlated with the behavioral intention of purchasing suboptimal foods under the COVID-19 pandemic. The above hypothesis verification can prove that Perceived Benefits have an impact on

TPB [42,44], and will not directly affect Behavioral Intention, but through Attitude Toward Behavior, Subject Norm, and Perceived Behavioral Control. In addition, the impact of Perceived Benefits on Attitude Toward Behavior, Subject Norm, and Perceived Behavioral Control ranks in the top 3 of all impact paths, which means that Perceived Benefits is an important dimension affecting consumer perception [70]. If consumers perceive suboptimal foods as being no different from optimal foods in terms of taste or nutrition, and the prices are more economical than those of the optimal foods [71], consumers will realize the perceived benefits of suboptimal foods, thereby increasing their purchase willingness. During the pandemic, many people cannot work, due to quarantine or poor business situations, and thus have lower incomes [72]. The relatively sufficient quantity and low prices of suboptimal foods have increased their priority in consumer purchase. Once consumers realize that there is no difference between suboptimal foods and optimal foods, with the exception of a slight difference in appearance, they may become long-term buyers of suboptimal foods. About 35% of the respondents were under 30 years old, which was also in line with China's school suspension policy during the pandemic. Many students stayed at home and waited for the slowdown of the pandemic. This type of consumer also experienced suboptimal foods actively and passively, which cannot be ignored, and may change the stereotype of suboptimal foods. During the pandemic, food delivery systems in some communities in China may also give priority to suboptimal foods. Suboptimal foods are preferred because they are cheap and easily available, and people's primary goal is to survive.

H9 is not rejected, which means that the attitude of consumers has a significant positive correlation with the behavioral intention of purchasing suboptimal foods under the COVID-19 pandemic. H10 is not rejected, which means that the subject norm of consumers has a significant positive correlation with the behavioral intention of consumers of purchasing suboptimal foods under the COVID-19 pandemic. H11 is not rejected, which means that the Perceived Behavioral Control of consumers has a significant positive correlation with the behavioral intention of purchasing suboptimal foods under the COVID-19 pandemic. It is proved that the Theory of Planned Behavior (TPB) [42,44] is still applicable under this topic, which means that TPB is a favorable indicator for predicting consumers' behavioral intention of purchasing suboptimal foods under the COVID-19 pandemic. Among Attitude Toward Behavior, Subject Norm, and Perceived Behavioral Control, Perceived Behavioral Control has the most significant impact on Behavioral Intention, followed by Attitude Toward Behavior. For consumers, autonomy and attitude have a greater impact on their purchase intentions of suboptimal foods.

The comprehensive analysis results show that the impacts of Perceived Benefits on Attitude Toward Behavior, Perceived Behavioral Control, and Subject Norm rank 1st, 2nd, and 3rd as the most influential factors, respectively, and are all higher than the impact of Environmental Concerns. For consumers, the most important issue is whether suboptimal foods have consumption motivation for them, which is also the most direct way to make consumers feel the value of suboptimal foods. The more environmentally friendly attribute of suboptimal foods is less likely to be perceived by consumers than economic incentives, but still has a considerable impact on consumers, especially during the COVID-19 pandemic. Many families have experienced a shock to their income during the pandemic [73], and consumers are more sensitive and concerned about commodity prices, which also makes lower-priced and more abundant suboptimal foods more popular. However, in the long run, suboptimal foods have a positive impact on reducing food waste and protecting the environment. When consumers realize this, they will be more determined to try and purchase suboptimal foods.

5. Conclusions and Suggestions

5.1. Conclusions

The contributions of this study are as follows: Based on previous research [73], the TPB model was combined with Environmental Concerns and Perceived Benefits, structural

equation modeling (SEM) was adopted to explore the dimensions that affect consumers' purchasing of suboptimal foods under the COVID-19 pandemic, and the relationship between Perceived Benefits and TPB under this topic was investigated. Through the relevant impact analysis of this study, each dimension has a direct or indirect impact on consumers' purchase intentions of suboptimal foods, which proves that this model is suitable under the food topic. Moreover, the added Perceived Benefits dimension was also proven to be reasonable. Meanwhile, the conclusions of this study can be used as a reference for the government, consumers, and relevant practitioners.

Overall, the 11 hypotheses established in this study showed that the research model is acceptable when explaining the dimensions affecting consumers' purchasing of suboptimal foods under the COVID-19 pandemic. It can be seen that consumers will consider many dimensions when choosing to purchase suboptimal foods, and the most influential dimension is the Perceived Benefits of consumers. In addition, consumers will be affected by other dimensions, including Environmental Concerns, Attitude Toward Behavior, Subject Norm, and Perceived Behavioral Control. These dimensions have different impacts on consumers' final purchase intentions, and the three dimensions of the TPB model, Attitude Toward Behavior, Subject Norm, and Perceived Behavioral Control, have a direct impact on the final purchase intentions, which means that as long as the consumer's attitude is changed or consumers are affected through people around them regarding suboptimal foods, the probability of consumers purchasing suboptimal foods is increased. The research results also showed that to change consumers through the above channels, the environmental motive (Environmental Concerns, EC) and the economic motive (Perceived Benefits, PB) can be improved [70], as these two dimensions will affect the Behavioral Intention of consumers through TPB, Attitude Toward Behavior, Subject Norm, and Perceived Behavioral Control. Moreover, according to the research results, EC cannot directly affect the Behavioral Intention of consumers, which is consistent with the results of previous research [73]. Perceived Benefits cannot directly affect intentions, proving that these two dimensions can only have an impact on consumers through a certain medium (TPB). The COVID-19 pandemic is an opportunity for many consumers to contact, understand, and purchase suboptimal foods. Whether the pandemic continues or ends, suboptimal foods must be promoted due to their economic and environmental friendliness. Therefore, in order to guide consumers to purchase suboptimal foods, they must be affected by economic incentives and environmental protection concepts to trigger their subjective initiative and change. The government should actively promote the positive effects of suboptimal foods on society, the economy, and the environment, popularize the correct knowledge of suboptimal foods, correct consumers' misconceptions, and guide consumers to purchase suboptimal foods. Manufacturers can launch suboptimal food purchase promotions, such as discount coupons or consumption credits, thereby increasing consumers' purchase enthusiasm. Consumers who have purchased suboptimal foods and have a positive impression can also recommend suboptimal foods to their relatives and friends while purchasing suboptimal foods themselves.

5.2. Research Limitations and Future Research Suggestions

Some limitations of this research may inspire future research topics. First, this study did not include differential analysis of the research subjects, such as whether consumers of different genders and ages have different opinions on suboptimal foods. In the future, researchers can investigate this topic. Secondly, suboptimal foods include poor appearance, upon expiration, and damaged packaging. This study did not consider the differences in those attributes. In the future, researchers may conduct detailed research on the different types of suboptimal foods. Thirdly, the scope of this study covers the consumer perceptions of suboptimal foods under the COVID-19 pandemic. When the pandemic is over, researchers may study consumer perceptions to compare the differences post-pandemic. Last but not least, different countries or regions may have different views on suboptimal foods. In the future, researchers can explore the situations in different regions to provide

references for the local government, schools, and related practitioners for more informed decision-making.

References

1. Parfitt, J.; Barthel, M.; Macnaughton, S. Food waste within food supply chains: Quantification and potential for change to 2050. *Philos. Trans. R. Soc. B Biol. Sci.* **2010**, *365*, 3065–3081. [CrossRef]
2. F.A.O. *Food Wastage Footprint: Impacts on Natural Resources*; FAO: Rome, Italy, 2013.
3. UnitedNations. *Report of the Secretary-General: Progress towards the Sustainable Development Goals*; UnitedNations: New York, NY, USA, 2020.
4. Lemaire, A.; Limbourg, S. How can food loss and waste management achieve sustainable development goals? *J. Clean. Prod.* **2019**, *234*, 1221–1234. [CrossRef]
5. Aschemann-Witzel, J.; de Hooge, I.; Normann, A. Consumer-related food waste: Role of food marketing and retailers and potential for action. *J. Int. Food Agribus. Mark.* **2016**, *28*, 271–285. [CrossRef]
6. Aschemann-Witzel, J. Consumer perception and preference for suboptimal food under the emerging practice of expiration date based pricing in supermarkets. *Food Qual. Prefer.* **2018**, *63*, 119–128. [CrossRef]
7. Helmert, J.R.; Symmank, C.; Pannasch, S.; Rohm, H. Have an eye on the buckled cucumber: An eye tracking study on visually suboptimal foods. *Food Qual. Prefer.* **2017**, *60*, 40–47. [CrossRef]
8. de Hooge, I.E.; Oostindjer, M.; Aschemann-Witzel, J.; Normann, A.; Loose, S.M.; Almli, V.L. This apple is too ugly for me!: Consumer preferences for suboptimal food products in the supermarket and at home. *Food Qual. Prefer.* **2017**, *56*, 80–92. [CrossRef]
9. Zhang, L.-Z.; Miao, Y.-H.; Fu, T.-T. Analysis of consumers' cognition and choice behavior towards imminent food. *Contemp. Econ.* **2021**, *11*, 73–77.
10. World Health Organization. Coronavirus Disease 2019 (COVID-19): Situation Report, 72. 2020. Available online: https://apps.who.int/iris/handle/10665/331685 (accessed on 10 May 2021).
11. Aldaco, R.; Hoehn, D.; Laso, J.; Margallo, M.; Ruiz-Salmón, J.; Cristobal, J.; Kahhat, R.; Villanueva-Rey, P.; Bala, A.; Batlle-Bayer, L.; et al. Environmental and nutritional impacts of dietary changes in spain during the COVID-19 lockdown. *Sci. Total Environ.* **2020**, *748*, 140524. [CrossRef] [PubMed]
12. Béné, C. Resilience of local food systems and links to food security—A review of some important concepts in the context of COVID-19 and other shocks. *Food Secur.* **2020**, *12*, 805–822. [CrossRef]
13. Hobbs, J.E. Food supply chains during the COVID-19 pandemic. *Can. J. Agric. Econ./Rev. Can. D'agroeconomie* **2020**, *68*, 171–176. [CrossRef]
14. Yuen, K.F.; Wang, X.; Ma, F.; Li, K.X. The psychological causes of panic buying following a health crisis. *Int. J. Environ. Res. Public Health* **2020**, *17*, 3513. [CrossRef]
15. Beretta, C.; Stoessel, F.; Baier, U.; Hellweg, S. Quantifying food losses and the potential for reduction in switzerland. *Waste Manag.* **2013**, *33*, 764–773. [CrossRef] [PubMed]
16. Bunn, D.; Feenstra, G.W.; Lynch, L.; Sommer, R. Consumer acceptance of cosmetically imperfect produce. *J. Consum. Aff.* **1990**, *24*, 268–279. [CrossRef]
17. White, K.; Lin, L.; Dahl, D.W.; Ritchie, R.J.B. When do consumers avoid imperfections? Superficial packaging damage as a contamination cue. *J. Mark. Res.* **2016**, *53*, 110–123. [CrossRef]
18. Halloran, A.; Clement, J.; Kornum, N.; Bucatariu, C.; Magid, J. Addressing food waste reduction in denmark. *Food Policy* **2014**, *49*, 294–301. [CrossRef]
19. Zhao, S.; Lin, Q.; Ran, J.; Musa, S.S.; Yang, G.; Wang, W.; Lou, Y.; Gao, D.; Yang, L.; He, D.; et al. Preliminary estimation of the basic reproduction number of novel coronavirus (2019-ncov) in china, from 2019 to 2020: A data-driven analysis in the early phase of the outbreak. *Int. J. Infect. Dis.* **2020**, *92*, 214–217. [CrossRef] [PubMed]
20. Wilder-Smith, A.; Freedman, D.O. Isolation, quarantine, social distancing and community containment: Pivotal role for old-style public health measures in the novel coronavirus (2019-ncov) outbreak. *J. Travel Med.* **2020**, *27*, taaa020. [CrossRef] [PubMed]

21. Roy, D.; Tripathy, S.; Kar, S.K.; Sharma, N.; Verma, S.K.; Kaushal, V. Study of knowledge, attitude, anxiety & perceived mental healthcare need in indian population during COVID-19 pandemic. *Asian J. Psychiatry* **2020**, *51*, 102083.
22. Kinnunen, P.; Guillaume, J.H.A.; Taka, M.; D'Odorico, P.; Siebert, S.; Puma, M.J.; Jalava, M.; Kummu, M. Local food crop production can fulfil demand for less than one-third of the population. *Nat. Food* **2020**, *1*, 229–237. [CrossRef]
23. The, L. COVID-19: Too little, too late? *Lancet* **2020**, *395*, 755.
24. Verghese, K.; Lewis, H.E.; Lockrey, S.; Williams, H. *The Role of Packaging in Minimising Food Waste in the Supply Chain of the Future*; RMIT University: Melbourne, Australia, 2013.
25. Kim, Y.; Choi, S.M. Antecedents of green purchase behavior: An examination of collectivism, environmental concern, and pce. *ACR N. Am. Adv.* **2005**. Available online: https://www.acrwebsite.org/volumes/9156/volumes/v32/na- (accessed on 7 November 2021).
26. Crosby, L.A.; Gill, J.D.; Taylor, J.R. Consumer/voter behavior in the passage of the michigan container law. *J. Mark.* **1981**, *45*, 19–32. [CrossRef]
27. Hardin, G. The tragedy of the commons. *Science* **1968**, *162*, 1243–1248. [CrossRef]
28. Tam, K.-P.; Chan, H.-W. Environmental concern has a weaker association with pro-environmental behavior in some societies than others: A cross-cultural psychology perspective. *J. Environ. Psychol.* **2017**, *53*, 213–223. [CrossRef]
29. Lin, P.-C.; Huang, Y.-H. The influence factors on choice behavior regarding green products based on the theory of consumption values. *J. Clean. Prod.* **2012**, *22*, 11–18. [CrossRef]
30. Tong, Q.; Anders, S.; Zhang, J.; Zhang, L. The roles of pollution concerns and environmental knowledge in making green food choices: Evidence from chinese consumers. *Food Res. Int.* **2020**, *130*, 108881. [CrossRef]
31. Stangherlin, I.D.C.; Duarte Ribeiro, J.L.; Barcellos, M. Consumer behaviour towards suboptimal food products: A strategy for food waste reduction. *Br. Food J.* **2019**, *121*, 2396–2412. [CrossRef]
32. Makhal, A.; Robertson, K.; Thyne, M.; Mirosa, M. Normalising the "ugly" to reduce food waste: Exploring the socialisations that form appearance preferences for fresh fruits and vegetables. *J. Consum. Behav.* **2021**, *20*, 1025–1039. [CrossRef]
33. Aschemann-Witzel, J.; Otterbring, T.; de Hooge, I.E.; Normann, A.; Rohm, H.; Almli, V.L.; Oostindjer, M. Consumer associations about other buyers of suboptimal food—And what it means for food waste avoidance actions. *Food Qual. Prefer.* **2020**, *80*, 103808. [CrossRef]
34. Lang, L.; Wang, Y.; Chen, X.; Zhang, Z.; Yang, N.; Xue, B.; Han, W. Awareness of food waste recycling in restaurants: Evidence from china. *Resour. Conserv. Recycl.* **2020**, *161*, 104949. [CrossRef]
35. Schwepker, C.H.; Cornwell, T.B. An examination of ecologically concerned consumers and their intention to purchase ecologically packaged products. *J. Public Policy Mark.* **2018**, *10*, 77–101. [CrossRef]
36. Orbell, S.; Crombie, I.; Johnston, G. Social cognition and social structure in the prediction of cervical screening uptake. *Br. J. Health Psychol.* **1996**, *1*, 35–50. [CrossRef]
37. Tsujikawa, N.; Tsuchida, S.; Shiotani, T. Changes in the factors influencing public acceptance of nuclear power generation in japan since the 2011 fukushima daiichi nuclear disaster. *Risk Anal.* **2016**, *36*, 98–113. [CrossRef]
38. Yang, C.; Tu, J.-C.; Jiang, Q. The influential factors of consumers' sustainable consumption: A case on electric vehicles in china. *Sustainability* **2020**, *12*, 3496. [CrossRef]
39. Loebnitz, N.; Grunert, K.G. Impact of self-health awareness and perceived product benefits on purchase intentions for hedonic and utilitarian foods with nutrition claims. *Food Qual. Prefer.* **2018**, *64*, 221–231. [CrossRef]
40. Hingston, S.T.; Noseworthy, T.J. On the epidemic of food waste: Idealized prototypes and the aversion to misshapen fruits and vegetables. *Food Qual. Prefer.* **2020**, *86*, 103999. [CrossRef]
41. Aschemann-Witzel, J.; De Hooge, I.; Amani, P.; Bech-Larsen, T.; Oostindjer, M. Consumer-related food waste: Causes and potential for action. *Sustainability* **2015**, *7*, 6457–6477. [CrossRef]
42. Ajzen, I. From intentions to actions: A theory of planned behavior. In *Action Control*; Springer: Berlin/Heidelberg, Germany, 1985; pp. 11–39.
43. Fishbein, M. A behavior theory approach to the relations between beliefs about an object and the attitude toward the object. In *Mathematical Models in Marketing*; Springer: Berlin/Heidelberg, Germany, 1976; pp. 87–88.
44. Fishbein, M.; Ajzen, I. Belief, Attitude, Intention, and Behavior: An Introduction to Theory and Research. 1977. Available online: https://philarchive.org/archive/FISBAI (accessed on 9 November 2021).
45. Kassem, N.O.; Lee, J.W.; Modeste, N.N.; Johnston, P.K. Understanding soft drink consumption among female adolescents using the theory of planned behavior. *Health Educ. Res.* **2003**, *18*, 278–291. [CrossRef]
46. Tarkiainen, A.; Sundqvist, S. Subjective norms, attitudes and intentions of finnish consumers in buying organic food. *Br. Food J.* **2005**, *107*, 808–822. [CrossRef]
47. Shah Alam, S.; Mohamed Sayuti, N. Applying the theory of planned behavior (tpb) inhalalfood purchasing. *Int. J. Commer. Manag.* **2011**, *21*, 8–20. [CrossRef]
48. El Khoury, D.; Dwyer, J.J.M.; Fein, L.; Brauer, P.; Brennan, S.; Alfaro, I. Understanding the use of dietary supplements among athlete and non-athlete university students: Development and validation of a questionnaire. *Sports* **2019**, *7*, 166. [CrossRef]
49. Cembalo, L.; Caso, D.; Carfora, V.; Caracciolo, F.; Lombardi, A.; Cicia, G. The "land of fires" toxic waste scandal and its effect on consumer food choices. *Int. J. Environ. Res. Public Health* **2019**, *16*, 165. [CrossRef]
50. Ajzen, I. The theory of planned behavior. *Organ. Behav. Hum. Decis. Process.* **1991**, *50*, 179–211. [CrossRef]

51. Taylor, S.; Todd, P.A. Understanding information technology usage: A test of competing models. *Inf. Syst. Res.* **1995**, *6*, 144–176. [CrossRef]

52. Ajzen, I. Consumer attitudes and behavior: The theory of planned behavior applied to food consumption decisions. *Ital. Rev. Agric. Econ.* **2015**, *70*, 121–138.

53. Porpino, G. Household food waste behavior: Avenues for future research. *J. Assoc. Consum. Res.* **2016**, *1*, 41–51. [CrossRef]

54. Kim, D.J.; Ferrin, D.L.; Rao, H.R. Trust and satisfaction, two stepping stones for successful e-commerce relationships: A longitudinal exploration. *Inf. Syst. Res.* **2009**, *20*, 237–257. [CrossRef]

55. Kim, G.; Shin, B.; Lee, H.G. Understanding dynamics between initial trust and usage intentions of mobile banking. *Inf. Syst. J.* **2009**, *19*, 283–311. [CrossRef]

56. Zhang, L.; Fan, Y.; Zhang, W.; Zhang, S. Extending the theory of planned behavior to explain the effects of cognitive factors across different kinds of green products. *Sustainability* **2019**, *11*, 4222. [CrossRef]

57. Jang, S.Y.; Chung, J.Y.; Kim, Y.G. Effects of environmentally friendly perceptions on customers' intentions to visit environmentally friendly restaurants: An extended theory of planned behavior. *Asia Pac. J. Tour. Res.* **2014**, *20*, 599–618. [CrossRef]

58. Jackson, D.L. Revisiting sample size and number of parameter estimates: Some support for the n:Q hypothesis. *Struct. Equ. Model. A Multidiscip. J.* **2003**, *10*, 128–141. [CrossRef]

59. Anderson, J.C.; Gerbing, D.W. Structural equation modeling in practice: A review and recommended two-step approach. *Psychol. Bull.* **1988**, *103*, 411–423. [CrossRef]

60. Hair, J.F.; Black, W.C.; Babin, B.J.; Anderson, R.E.; Tatham, R.L. *Multivariate Data Analysis*; Prentice hall: Upper Saddle River, NJ, USA, 1998; Volume 5.

61. Nunnally, J.; Jum, N.; Bernstein, I.H.; Bernstein, I. *Psychometric Theory*; McGraw-Hill Companies: New York, NY, USA, 1994.

62. Fornell, C.; Larcker, D.F. Evaluating structural equation models with unobservable variables and measurement error. *J. Mark. Res.* **2018**, *18*, 39–50. [CrossRef]

63. Chin, W.W. Commentary: Issues and opinion on structural equation modeling. *Commentary* **1998**, *22*, 7–16.

64. Hooper, D.; Coughlan, J.; Mullen, M.R. Structural equation modelling: Guidelines for determining model fit. *Electron. J. Bus. Res. Methods* **2008**, *6*, 53–60.

65. Jackson, D.L.; Gillaspy Jr, J.A.; Purc-Stephenson, R. Reporting practices in confirmatory factor analysis: An overview and some recommendations. *Psychol. Methods* **2009**, *14*, 6. [CrossRef]

66. Kline, R.B. *Principles and Practice of Structural Equation Modeling*, 4th ed.; Guilford publications: New York, NY, USA, 2015.

67. Whittaker, T.A. *A Beginner's Guide to Structural Equation Modeling*; Taylor & Francis: Abingdon, UK, 2011.

68. Hu, L.t.; Bentler, P.M. Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Struct. Equ. Model. A Multidiscip. J.* **1999**, *6*, 1–55. [CrossRef]

69. Richter, B.; Bokelmann, W. The significance of avoiding household food waste—A means-end-chain approach. *Waste Manag.* **2018**, *74*, 34–42. [CrossRef]

70. Steptoe, A.; Pollard, T.M.; Wardle, J. Development of a measure of the motives underlying the selection of food: The food choice questionnaire. *Appetite* **1995**, *25*, 267–284. [CrossRef]

71. Aschemann-Witzel, J.; Giménez, A.; Ares, G. Consumer in-store choice of suboptimal food to avoid food waste: The role of food category, communication and perception of quality dimensions. *Food Qual. Prefer.* **2018**, *68*, 29–39. [CrossRef]

72. Chakraborty, I.; Maity, P. Covid-19 outbreak: Migration, effects on society, global environment and prevention. *Sci. Total Environ.* **2020**, *728*, 138882. [CrossRef] [PubMed]

73. Tsai, W.-C.; Chen, X.; Yang, C. Consumer food waste behavior among emerging adults: Evidence from china. *Foods* **2020**, *9*, 961. [CrossRef] [PubMed]