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Exploring Key Factors Determining US Consumer Preferences for Growing over Buying Fruit in Pre-Covidian and Covidian Times

Meike Rombach [1,*], David L. Dean [2] and Tim Baird [2]

[1] Department of Land Management and Systems, Lincoln University, Lincoln 7647, New Zealand
[2] Department of Agribusiness and Markets, Lincoln University, Lincoln 7647, New Zealand; david.dean@lincoln.ac.nz (D.L.D.); tim.baird@lincoln.ac.nz (T.B.)
* Correspondence: meike.rombach@lincoln.ac.nz

Abstract: This study provides insights for managers in the food retail sector, the horticultural industry, actors involved in community gardening and farmers' markets. It proposes a model that investigates key factors determining US consumer preferences for growing fruit over buying it in pre-Covidian and Covidian times. For this purpose, an online survey with a sample of 383 US residents was conducted. Partial least squares structural equation modelling shows that subjective knowledge about fruit and the perceived impact of COVID-19 are the most important drivers of preferences for growing over buying in Covidian times. The impact of COVID-19 had no relevance for the pre-Covidian times. For both scenarios, only age and gender as socio-demographic factors were found to influence subjective knowledge and the perceived impact of COVID-19. Other sociodemographic factors were not found to have any impact.

Keywords: COVID-19; fruit; gardening; knowledge; US consumers

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1. Introduction

In 2019, an outbreak of a severe acute respiratory syndrome coronavirus type 2 (COVID-19) led to a global pandemic [1,2]. The quick transmission of the virus in the United States (US) in February 2020 resulted in societal and economic disruptions along with adjustments to everyday life [3]. These adjustments required remaining physically distant in public places, mask wearing, prolonged stay at home periods and drastic changes in consumer behaviour [4–6]. The threat of the virus caused American consumers to commit to panic and bulk buying [7–11]. In retail, shelves were cleared of toilet paper, disinfectant products, canned food, fresh produce and other horticultural products because demand for these items had outweighed supply [12]. Products that were at risk of being out of stocked were restricted for purchase in terms of quantities [3].

These seemingly unusual buying behaviours are in fact relatively common, as studies on consumer behaviour after extreme events (such as earthquakes or tornados) demonstrate [9]. Bulk and panic buying are motivated by a fear of unpreparedness, and stem from evolutionary human instinct [9,13–15]. Undoubtfully, the global pandemic increased the popularity of online purchases [4,16–18], driving consumption trends, such as ethical and sustainable consumption, healthy living, self-sufficiency and do-it-yourself (crafting, building, cooking and gardening projects) [19]. These trends are relevant to horticultural products and services and are expected to remain relevant in the coming years [19–21].

Self-sufficiency and do-it-yourself (DIY) as trends gained popularity among the middle class and lower income classes due to the economic consequences that can be attributed to COVID-19 [19]. Approximately 25 percent of all American citizens are affected by unemployment, and thus must cope with changes to their economic situation and lifestyle [19].

Owning a garden or participating in forms of community supported agriculture, such as community gardens, have been seen as ways to counteract hardships or to keep up a

particular lifestyle [2,22–26]. Furthermore, these can be described as forms of prominent horticultural activities that are not only beneficial to mental and physical wellbeing, but are also strongly based on self-sufficiency, DIY and healthy living [2,19,27–30]. Amidst this background, this study is focused on two of these trends, namely DIY and healthy living. It aims to explore key factors determining American consumer preferences for growing over the buying of essential horticultural products, such as fruits, that contribute to healthy diets. The study compares and contrasts this within the context of a pre-COVID-19 scenario and a pandemic scenario.

2. Background

American consumers' socio-demographic backgrounds. their knowledge about fruit and the perceived impact of COVID-19 are likely to be key factors determining the preference for growing over the buying of fruit in pre-Covidian times as well as in Covidian times [4,5,31–33]. In the remainder of this section, these factors are explained in more detail as they serve to build the conceptual framework. Prior to the examination of this, the rational of buying as opposed to the growing of fruit in the United States is outlined [34–42]. The subsequent literature review of the key factors builds on horticultural studies, which focus on targeting fresh produce, agricultural and viticultural studies. Products from these four areas are based on fruit, or products of a similar nature to fruit, in terms of their perishability and complexity with respect to existing consumer knowledge [33].

2.1. Buying and Growing Fruit in the United States

Bananas, apples and oranges are the most popular fruit in the United States [34]. However, the consumption of fresh fruit and vegetables is still classified as suboptimal. The total expenditure on fresh fruits and vegetables for households within the United States is approximately USD 977 per year [35]. On average, a United States citizen consumes only one serving of fruit per day, which is far below current dietary recommendations [36]. The per capita consumption is 115.8 pounds of fresh fruit per annum [37]. Americans either purchase or grow the fruit that they consume, with fruit available from supermarkets, specialist stores and farmers' markets. California, Florida, Washington, Michigan, New York, Oregon and Pennsylvania are the most important fruit-producing states [38]. Seasonal gaps are filled with fruit from the Southern Hemisphere countries at times where fruit grown within the United States is not sufficiently available [39]. Growing fruit in one's own garden or participating in a community garden is motivated by needs associated with food safety and the control of food procurement [40–42]. The desire to be included in community and physical activity has also been cited as an important motivating factor [40–42].

2.2. Socio-Demographics

Several studies have reported socio-demographic backgrounds of people buying fresh produce, including fruit in the United States, but the body of literature is rather inconclusive. Some of these studies have indicated that fruit purchase is associated with gender, age, income and rurality [43]. Being female, having a high income and living in a rural area have been found to be key characteristics of fruit consumers [43–45]. Other studies suggest that higher education [45–47] and age [44–46] are important characteristics. A third line of study suggests that socio-demographic backgrounds do not have as much impact on fruit consumption and purchase. These studies emphasise dietary preferences, attitudes and lifestyle as key-factors [48,49]. Similarly, the body of literature on growing fresh produce and gardening is equally ambiguous. While on one hand age, income and ethnicity seem to impact home gardening or participation in a community garden, lifestyle and existing gardening habits are equally important [39–41]. With respect to both growing fruit or buying fresh fruit, regional differences have been found [31,47,48,50–52], but it remains unclear whether COVID-19 has permanently changed growing behaviours. Trends towards DIY and self-sufficiency suggest that people from the middle and lower income

classes may be leaning more towards growing as a strategy to overcome hardship caused by COVID-19 [19].

2.3. Consumer Knowledge Concerning Fruit

Research dedicated to horticultural, agricultural and viticultural products is often focused on consumer purchase decision-making and information practices [32,53]. The most important information source is the internet, which includes websites from consumer organizations, governmental bodies and product reviews [32]. Equally important are sources, such as product knowledge, knowledge about production processes and product experience [32,54].

Knowledge is commonly distinguished between actual (objective knowledge) and perceived knowledge (subjective knowledge) [55]. Objective knowledge is stored in the consumers' long-term memory and is usually assessed through testing or verification against expert knowledge. By contrast, subjective knowledge is based on the direct experience of consumers and their interpretation of these experiences. Subjective knowledge is commonly assessed through the self-reporting of an individual consumer's perceived level of confidence in a given product area [32,55–58]. Therefore, subjective knowledge can be described as the perceived estimation of knowledge, which still has the potential to be proven incorrect [58].

In the area of wine marketing, a consumer knowledge typology has been developed that is likely to be also applicable to fresh fruit [57]; this typology is based on high and low divisions of subjective and objective knowledge [57]. Further acquisition of knowledge regarding a product and its production processes can be as equally challenging for fruit as it is for wine. This may apply for both home-grown and commercially grown products. This typology presents four consumer types. Consumers who know very little and perceive themselves as knowing very little, have been classified as "Neophytes"; this is because these consumers have just started learning about wine products [57]. By way of contrast, consumers who have overestimated what they really know were classified as "Snobs". The third category, who are classified as "Modest consumers" commonly underestimate their knowledge; they actually know more than they think they do. "Experts" are usually aware of their knowledge, and thus this classification correctly indicates their high level of knowledge [57].

The body of literature on objective and subjective knowledge is not entirely conclusive [53,54]. While some studies refer to the correlation between subjective and objective knowledge and suggest both types of knowledge are interconnected, other studies have shown that they can be different [58]. These studies emphasise that subjective and objective are not consistently correlated and may even involve the Dunning–Kruger effect [58]. However, there is a consensus that knowledge is an important factor in purchase decisions, and that subjective and objective knowledge can be distinguished conceptually and empirically [51]. Given that subjective knowledge relates to belief of available information and beliefs about a specific product, these beliefs are the central stimulus for measuring subjective consumer knowledge [51,54].

For horticultural and agricultural products, consumers' beliefs and their resulting concerns can be quite strong. These beliefs are commonly related to nutrition, health, specific ways of production and production processes [52,59–61], and may influence preferences for the growing of fruit over the buying of fruit. Considering the previously addressed areas of consumer beliefs, fruit might be seen as an information intensive product [57], where the beliefs held about these products are closely linked to their personal meanings and memories stored in the mind of the consumer [57]. It is for this reason that the present study is focused solely on subjective knowledge.

2.4. Impact of COVID-19

Throughout 2021, various studies have analysed the impact of COVID-19 in the United States at an individual and societal level [62–64]. In the context of buying or growing food,

physical distance, panic buying, mask wearing and getting tested, along with being or not being vaccinated have been reported as important factors [5,9,12]. These attitudes, beliefs and behaviours of American consumers towards these topics are quite diverse [5]. Some consumers are positive towards measures that improve public health, such as wearing masks, getting tested and/or getting vaccinated. They agree that these measures reduce community spreading, limit the number of deaths and help prevent lockdowns [5,65–67]. Others are uncertain or are against these measures. Perceived reduction of their citizen rights or belief in conspiracy theories are often reasons for their opposition [5,67].

2.5. Conceptual Framework

A conceptual framework based on the literature is proposed. It is suggested that American consumer preferences for the growing of fruit over the buying of fruit in Covidian times is likely to be influenced by their socio-demographic backgrounds, their subjective knowledge about fruit and their perception of the impact of COVID-19 (see Figure 1). In the pre-Covidian case, the perception of COVID-19 has no relevance. The following hypotheses are proposed:

Hypotheses 1 (H1). *The subjective knowledge of US consumers is likely to be impacted by (a) age, (b) level of education, (c) income and (d) gender.*

Hypotheses 2 (H2). *US consumers' perceived impact of COVID-19 is likely to be impacted by (a) age, (b) level of education, (c) income and (d) gender.*

Hypotheses 3 (H3). *Subjective knowledge is likely to positively impact US consumer preferences for the growing of fruit over the buying of fruit in Covidian times.*

Hypotheses 4 (H4). *Subjective knowledge is likely to positively impact US consumer preferences for the growing of fruit over the buying of fruit in pre-Covidian times.*

Hypotheses 5 (H5). *US consumers' perceived impact of COVID-19 is likely to positively impact their preferences for the growing of fruit over the buying of fruit in Covidian times.*

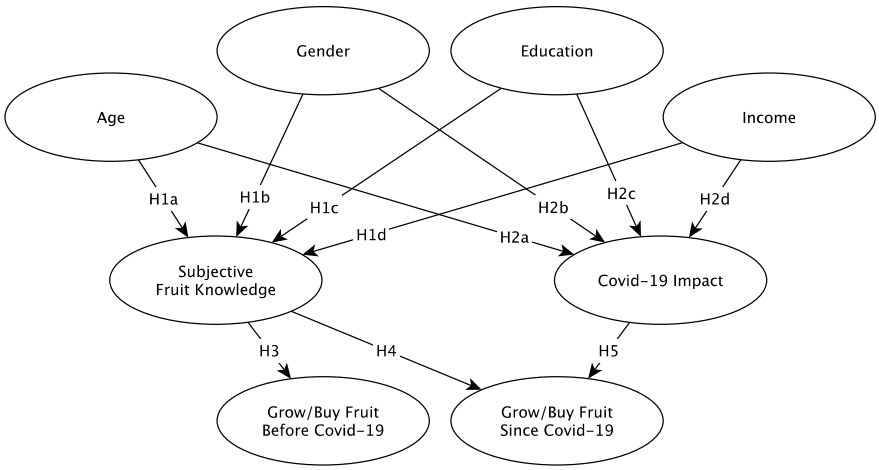

Figure 1. Conceptual Model and Proposed Hypotheses.

3. Material and Methods

3.1. Data Collection

In October 2021, an online survey was conducted via Qualtrics and distributed through Amazon Mechanical Turk. The survey gathered information about residents of the United States and their preferences for fruit. Amazon Mechanical Turk is a crowdsourcing platform [68,69]. The survey was designed to collect socio-demographic information as well as respondents' knowledge about fruit, their attitudes and perception towards buying fruit locally, and their preferences for fruit and product attributes. Respondents had to be residents of the United States and be of legal age to participate in the survey. The data collection resulted in 1000 responses, of which 383 responses were complete and appropriate for analysis. The sample was targeted towards fruit purchasers and minimum sample size was calculated considering a 5% margin of error, a 95% confidence level, a population size of 333,648,943 people and a sample proportion of 50%. Consequently, the sample of 383 residents of the United States who completed the survey is sufficient to determine American consumers' socio-demographic backgrounds, their knowledge about fruit and their perceived impact of COVID-19 via partial least squares structural equation modelling (PLS-SEM).

3.2. Construct Measurement

Ideally, the research would have used tested and validated scales from the literature, but when researching emerging issues, such as COVID-19, the availability of such scales is often limited. Thus, measurement items were developed from the relevant concepts proposed in the literature. Subjective fruit knowledge (4 items) and perceived impact of COVID-19 (5 items) were measured using 7-point Likert scales (1 = strongly disagree to 7 = strongly agree). The subjective fruit knowledge scale included statements about fruit understanding, confidence, and knowledge relative to others. The perceived impact of COVID-19 scale included statements about the perceived impact of COVID-19 on culture, society, fairness, instability and control. Buying vs. growing fruit before and since the emergence of COVID-19 (3 items each) were measured with 0–100 sliding scales anchored by regularly purchase (0) and grown by myself (100).

3.3. Data Analysis

Descriptive statistics were used to characterise the sample of US residents and PLS-SEM was used to explore the key factors driving preferences for growing over buying. PLS-SEM is widely used in the social sciences, such as in the disciplines of management, marketing and psychology. The approach combines three forms of analysis: path analysis, principal component analysis and regression analysis [70,71], focusing sequentially on the measurement model then the structural model (outer then inner model) [72,73]. The first step, called the measurement model or outer model analysis, checks that the model is measuring the proposed constructs, which is achieved through reliability and validity testing [70,73]. Indicator loadings greater than 0.4 verify that items are making a contribution to the scale and average variance extracted (AVE), and scores greater than 0.5 confirm that a scale has captured a sufficient amount of variance of its items. The internal consistency or reliability of scale items are measured via Cronbach's Alpha (>0.6) and composite reliability (>0.6) [74].

Discriminant validity is considered achieved when a proposed scale can be shown to measure a construct that is distinct from other constructs, and that the proposed items are most aligned with the proposed scale. Using the Fornell–Larcker criterion and reviewing the cross-loadings is one way to determine discriminant validity [75]. Specifically, all items should align with their proposed scale, and these correlations should be higher than their correlation with other scales [73]. The heterotrait–monotrait (HTMT) examines the correlations of items within a scale and correlations between items of different scales and calculates a ratio. If this HTMT ratio is less than 0.9, discriminant validity can be

confirmed [76]. Finally, variance inflation factor (VIF) is calculated to determine whether multicollinearity in the data is problematic, and the target threshold is less than 5 [70,73].

The second step, called the structural model or inner model analysis, examines the structural fit, the explanatory power, and the predictive relevance of the model [73]. Hair et al. (2017) suggest caution is used regarding the interpretability of model fit indices in SEM-PLS [74]. However, following traditions of covariance based SEM model reporting, some goodness of fit measures are offered. Summary measures of model fit, such as goodness of fit (GoF) and normed fit index (NFI), are typical and higher scores are considered better. Residual scores, such as the standardised root mean square residual (SRMR), indicated better fit if they are smaller. SRMR scores exceeding 0.10 are considered problematic, and acceptable scores are less than 0.08. R^2, or explanatory power, indicates the model's ability to explain the variance of the dependent constructs and Q^2, or predictive validity, uses the Stone Geisser criterion. Convention suggests that R2 are weak, moderate, and substantial, if they are 0.25, 0.50, and 0.75 respectively. Q2 values larger than zero are considered adequate, greater than 0.25 medium, and greater than 0.50 strong predictive relevance. Once both steps of the analysis return adequate results, the hypotheses can be tested. SPSS and SmartPLS were the statistical software used for the analyses.

4. Results

Sample demographics are shown in Table 1, with a median respondent aged 25–34 years, with a bachelor's degree and an annual pre-tax income between USD 25k and USD 50k per year.

Table 1. Sample Demographics.

	Freq	%	Median	StDev
Age				
Under 21	2	0.5		
21–24	16	4.2		
25–34	215	56.1	✓	0.940
35–44	104	27.2		
45–54	27	7.0		
55–64	14	3.7		
65+	5	1.3		
Total	383	100		
Education				
Did not finish high school	6	1.6		
Finished high school	46	12.0		
Attended university	40	10.4		
Bachelor's Degree	223	58.2	✓	0.927
Postgraduate Degree	68	17.8		
Total	383	100		
Household Annual Income				
USD 0 to USD 24,999	80	20.9		
USD 25,000 to USD 49,999	117	30.5	✓	1.141
USD 50,000 to USD 74,999	119	31.1		
USD 75,000 to USD 99,999	40	10.4		
USD 100,000 or higher	27	7.0		
Total	383	100		
Gender				
Male	196	51.2	✓	0.501
Female	187	48.8		
Total	383	100		

Table 2 shows item-factor loadings of greater than 0.4, confirming that they sufficiently contributed to their relevant construct scale. The reliability scores were above 0.6 (both Cronbach's alpha and composite reliability), confirming reliability. Convergent validity was confirmed with all AVE scores above 0.5. Therefore, construct reliability and validity were deemed to have been satisfied [73].

Table 2. Reliability and Validity Check.

Scales and Items	Factor Loadings	Cronbach's Alpha	Composite Reliability	Average Variance Extracted
Subjective Fruit Knowledge		0.861	0.905	0.704
I understand a lot about fruit	0.784			
I am confident in my knowledge of fruit	0.797			
Among my friends I am the fruit expert	0.896			
I know more about fruit than others do	0.875			
COVID-19 Impact		0.793	0.842	0.522
I feel COVID-19 has changed our culture towards more inequality	0.836			
I feel COVID-19 has changed our societal structures towards distance	0.621			
I feel COVID-19 has changed societal processes towards unfairness	0.699			
I feel COVID-19 has changed our economy towards more instability	0.581			
I think COVID-19 has been made up to control citizens	0.836			
Grow vs. Buy Fruit Preference Before COVID-19		0.928	0.954	0.874
Before COVID-19, did you prefer buying or growing your own apples and other pip fruit?	0.932			
Before COVID-19, did you prefer buying or growing your own berries and other soft fruit?	0.953			
Before COVID-19, did you prefer buying or growing your own lemons and other citrus fruit?	0.919			
Grow vs. Buy Fruit Preference Since COVID-19		0.932	0.956	0.880
Since COVID-19, do you prefer buying or growing your own apples and other pip fruit?	0.941			
Since COVID-19, do you prefer buying or growing your own berries and other soft fruit?	0.945			
Since COVID-19, do you prefer buying or growing your own lemons and other citrus fruit?	0.927			

Table 3 shows that requirements for confirming discriminant validity have been met. The cross loadings were lower than square root of each construct's (AVE and HTMT) ratios were all less than 0.90, with the exception of the HTMT ratio between growing vs. buying since COVID-19 and growing vs. buying before COVID-19 (0.998), which is higher than recommended. However, this overlap is not problematic because the two constructs measure the same concept, but from two time perspectives (pre-COVID-19 and the present pandemic era). Moreover, the largest VIF was 1.564 and the average VIF was 1.169, indicating that multicollinearity was not a problem with the data [73].

Table 3. Scale Discriminant Validity.

Fornell–Larcker Criterion	COVID-19 Impact	Grow vs. Buy Fruit Since COVID-19	Grow vs. Buy Fruit before COVID-19	Subjective Fruit Knowledge
COVID-19 Impact	0.722			
Growing vs. Buying Fruit Since COVID-19	0.584	0.938		
Growing vs. Buying Fruit Before COVID-19	0.595	0.927	0.935	
Subjective Fruit Knowledge	0.601	0.570	0.601	0.839
Heterotrait–Monotrait Ratio				
COVID-19 Impact				
Growing vs. Buying Fruit Since COVID-19	0.571			
Growing vs. Buying Fruit Before COVID-19	0.590	0.998		
Subjective Fruit Knowledge	0.650	0.625	0.659	

With an adequate GoF (0.415), NFI (0.771) and acceptable SRMS (0.080), the model can be considered to have adequate fit. Overall, the model could be said to have acceptable but weak explanatory power and predictive relevance with average R^2/Q^2 values of 0.231/0.186. However, some parts of the model were stronger than others. The R^2/Q^2

scores of 0.084/0.051 for subjective fruit knowledge and 0.061/0.017 for COVID-19 impact would be considered to show weak explanatory power and predictive relevance, but the 0.362/0.313 for growing/buying fruit before COVID-19, and 0.417/0.361 for growing/buying fruit since COVID-19 would be considered to have moderate explanatory power and medium predictive relevance. Therefore, with an adequate model fit, weak to moderate explanatory power, and with weak to medium predictive accuracy, the structure of the model is confirmed to be a fit for hypothesis testing.

Table 4 and Figure 2 show the results of the hypothesis testing. Age and gender were significantly related to subjective fruit knowledge and COVID-19 impact, supporting H1a, H1b, H2a and H2b. Income and level of education were not significantly related to subjective fruit knowledge or COVID-19 impact, so no support was found for H1c, H2c, H1d or H2d. H3 and H4 were supported as subjective fruit knowledge was significantly related to the growing of fruit or buying of fruit before and during COVID-19, and the perceived impact of COVID-19 was significantly related to the growing of fruit or buying of fruit since COVID-19, supporting H5.

Table 4. Results from Hypothesis Testing.

Hypothesised Relationship	Coefficient	T Stat	*p* Value
H1a: Age -> Subjective Fruit Knowledge	**−0.202**	3.631	0.000
H2a: Age -> COVID-19 Impact	**−0.151**	2.824	0.005
H1b: Gender -> Subjective Fruit Knowledge	**−0.162**	3.281	0.001
H2b: Gender -> COVID-19 Impact	**−0.142**	2.673	0.008
H1c: Level of Education -> Subjective Fruit Knowledge	0.047	0.965	0.335
H2c: Level of Education -> COVID-19 Impact	0.001	0.022	0.983
H1d: Income -> Subjective Fruit Knowledge	−0.024	0.422	0.673
H2d: Income -> COVID-19 Impact	−0.066	1.240	0.215
H3: Subjective Fruit Knowledge -> Growing vs. Buying Fruit Pre-COVID-19	**0.601**	15.095	0.000
H4: Subjective Fruit Knowledge -> Growing vs. Buying Fruit Post-COVID-19	**0.343**	5.548	0.000
H5: COVID-19 Impact -> Grow vs. Buy Fruit Post-COVID-19	**0.378**	6.466	0.000

Bold = $p < 0.01$.

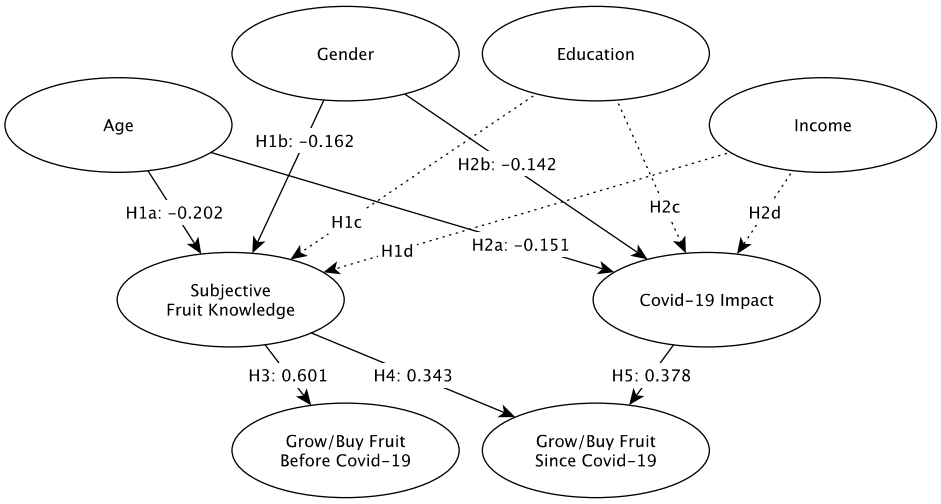

Figure 2. Conceptual Model Results.

5. Discussion

This study focused on key factors explaining American consumer preferences towards the growing of fruit over the buying of fruit in pre-Covidian times as well as during times of the COVID-19 pandemic. The conceptual model had an adequate fit and explanatory power. Subjective knowledge and the perceived impact of COVID-19 were the most important factors influencing preferences for the growing of fruit over the buying of fruit in Covidian times. The impact of COVID-19 had no relevance for the pre-Covidian times. For

both scenarios, only age and gender as socio-demographic factors were found to influence subjective knowledge and the perceived impact of COVID-19.

Findings concerning the socio-demographic backgrounds of American consumers and their impact on subjective knowledge confirm previous horticultural studies related to gardening food and flowers. Women tend to be the major plant and food buyers [77,78] are more involved in gardening, either in the home or at a community garden, and appear to be more informed and concerned about horticultural products and production practices [36,79,80]. Given that horticultural studies show that it is elderly people who have practical horticultural knowledge and are more informed about gardening, horticultural products and production practices, the findings relating to age seem surprising [79]. This negative association may imply that older consumers rated themselves modestly when evaluating their knowledge about fruit and fruit production [32,79].

The results about the impact of COVID-19 and socio-demographic factors are relatively straight forward and mostly in line with recent studies. These studies outlined various social, economic and medical issues related to children and home schooling, household management and food shopping, violence and domestic abuse during lockdown periods, pregnancy and taking care of the elderly or sick people, which are particularly relevant to women [80–84].

The negative association with age contrasts with previous studies presenting older generations as rather helpless and vulnerable. Indeed, prolonged stay at home periods may lead to isolation, which may negatively impact health conditions and can result in mortality [85]. However, these studies often forget to acknowledge that older people have life experience, have developed resilience, and are therefore coping with the adverse effects of COVID-19 because they likely mastered crises throughout their life. Other studies have reported proactive coping behaviours during lockdown periods. These included social online activities with family and friends, being physical active, committed to hobbies and following routines and structure [85].

The findings related to subjective knowledge as a driver of preferences for the growing of fruit over the buying of fruit can be explained by the fact that preferences guide decisions. Decisions are never entirely rational, and consumers rely on pre-existing knowledge, information cues, intuition and heuristics. Food knowledge can be complex and information intensive as well as is likely to be guided by personal beliefs and memories stored in the consumer's sensory mind [32,86]. Subjective knowledge is therefore even more important in Covidian times, as subjective knowledge linkages to personal beliefs and positive memories in the sensory mind may be comforting and beneficial to the wellbeing of the consumer and have some impact on resilience [87]. In a similar manner, the perceived impact of COVID-19 influences buying and growing preferences, which can be observed in Covidian times as well. The perception of personal and societal economic and social circumstances, as well as the need for physical activity and mental wellbeing is likely to affect the preference for growing fruit over the buying of fruit.

6. Managerial Implications

The findings of the present study are relevant to various stakeholders related to the horticultural industry, US food retailers and gardening communities. The trend of growing fruit over buying fruit is of interest to nursery businesses who may wish to increase their offerings of fruits and nuts and other plants, which contribute to the setup of edible gardens. In particular, local and traditional varieties may be an interesting addition to existing stock. Nursery businesses and contributors to community gardens and farmers' markets may wish to capitalise on these findings based around horticultural knowledge. Online demonstrations and discussions may be an appealing opportunity for consumers who wish to improve their practical horticultural skills, allowing them to grow fruit and to have better control over food procurement.

7. Limitations and Suggestions for Future Research

The present study used Amazon Mechanical Turk to collect data. The crowdsourcing platform has received criticism from some academics for data quality, low pricing and hence poor worker payment; despite these criticisms the platform has seen increased usage and growing popularity across many disciplines in the social sciences [68]. In terms of data quality, Amazon Mechanical Turk for data collection has been found to be equivalent to other forms of convenience sampling [68,69]. Given the conceptual framework of the model presented in this study, the small number of studies focused on the growing of fruit over the buying of fruit, and an increased consumer interest in horticultural activities and gardening in Covidian times, the present study addresses a timely issue. Due to the recency of the COVID-19 situation, it was felt that the research in its current form still adds value to the existing body of literature.

Future research could focus on buying local horticultural products within the context of connected consumerism [19]. Connected consumers are informed, ethically and socially conscious, and like to be connected with the businesses from which they purchase through technology, such as social media or Zoom [19]. They also like to be informed about the effects of COVID-19 on businesses, and even more importantly, on the people involved in the production of goods that they purchase [19]. Being supportive of the local economy and remaining connected to others gained even more importance for many consumers due to the disruptions of COVID-19; it is believed that both these trends are here to stay [3,19]. Further research could follow Bir et al. (2017) and explore the various motivations people have for participating in home gardening and community gardening and explore their preferences for specific types of produce being grown [32]. This could involve the production of vegetables, herbs and other specific produce grown in specific regions or preferred by local or ethnic communities [52]. Further, the aspects of childcare and growing physically distant but being socially connected are of crucial importance in Covidian times [25,32]. The preference comparison of growing over buying could be explored regionally, as various papers dedicated to fruit growing or fruit consumption have focused on specific geographic areas [33,46,50–52], instead of examining a national sample.

Research should also be dedicated to the willingness to pay for local food in the context of different online shopping scenarios. Such a study could compare traditional online retail and e-platforms, bringing together products from various local retailers who are building on the trend of reinventing shopping due to COVID-19 disruptions. This could extend the work of Campbell et al. (2021) [4]. Alternatively, research may focus on the trend of renting and borrowing [19], and may focus on food and seed swaps as trends in participative horticulture in Covidian times.

8. Conclusions

In this study of US fruit consumers, the results show that subjective knowledge regarding fruit is a strong driver of consumer preferences for growing fruit over buying fruit both prior to and since the COVID-19 pandemic. Perceived impact of Covid also contributes to preferences since COVID-19. For the past and present scenarios, only age and gender as socio-demographic factors were found to influence subjective knowledge and their perceived impact of COVID-19.

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