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The role of life satisfaction and locus of control in changing purchase intentions for organic and local food during the pandemic

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ABSTRACT

This study investigates the relation between locus of control, life satisfaction, and Covid-19 related changes in consumers’ intentions to purchase organic or local food. It is assumed that people with high internal locus of control pro-actively engage in pro-environmental behaviors, e.g. organic or local food consumption. In addition, literature suggests that internal locus of control positively influences life satisfaction and that the relation between life satisfaction and changes in local and organic food purchase intentions during the Covid-19 pandemic is mediated through food choice motives. The results of this study confirm these theoretical considerations. However, concerning the relation between internal locus of control and stated changes in food choices, a significant and positive relation could only be found between internal locus of control and the willingness to purchase more locally produced food items since the outbreak of the Covid-19 pandemic, but not between internal locus of control and the importance attached to organically produced food. As locus of control and life satisfaction have mainly been applied in health-related contexts so far, this study addresses the lack of research concerning its application in food and consumer behavior research. Comprehensive knowledge on these relations adds to theoretical framework building, and further research on these measures in different food-related contexts is necessary.

1. Introduction

At the beginning of 2020, the spread of a new corona virus (SARS-CoV-2) resulted in a world-wide pandemic with several measures on social distancing, limited curfew and reduced economic activity. These measures have influenced and still do influence the food choice and consumption behavior, but also behavior in general (Kirk and Rifkin 2020). Van Bavel et al. (2020) likewise report that the pandemic requires behavioral changes and stress that uncertainty influences behavior in time of crisis. The changes that people are facing in their daily lives coupled with uncertainty pose health, economic, social, informational, and environmental threats to consumers. Depending on the perceived extent of these threats the pandemic causes disruptions of consumers’ practices and routines. Cognitive responses to the pandemic and related policy action can have an impact on behavioral responses, implying for example that consumers prefer certain products that help them cope with their helplessness or compensate for the feelings of loss of control (Campbell, Inman, Kirmani and Price, 2020). Locus of control is a concept that refers to how strongly people believe they have control over the situations and experiences that affect their lives. In the context of the pandemic, one can assume that people with high internal locus of control (ILC) will be more prone to engage in food choices that help them to cope with the health and economic threats they are confronted with during Covid-19. Literature suggests that people with high ILC are less likely to feel hopeless, helpless and powerless, and pro-actively engage in behaviors that benefit their environment and induce change (Seipel, 1988; Jakoby and Jacob, 2001). Furthermore, research by Seipel (1988) and Hong and Giannakopoulos (1994) indicates that ILC is positively correlated with life satisfaction (LS) and research by Grant, Wardle and Steptoe (2009) suggests that the relation between LS and changes in the types of products that consumers choose during the pandemic may be mediated through food choice motives (FCM). In the early stage of the Covid-19 pandemic opinion polls were carried out, indicating that consumers show a higher interest in sourcing locally and sustainably produced food. Recent research shows that more people prepared their own food and hence spent more time reflecting on the origin and production standards of their food (e.g. Busch et al., 2020; Forsa Politik- und Sozialforschung GmbH, 2020). Concerns over food

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shortages, the perception of global food supply chains as being less robust and safe, and the avoidance of large crowds, amongst others, made consumers turn to more local and small-scale food supply chains or initiatives (Hobbs 2020; Leone et al. 2020; Schmidt, Goetz, Rocker and Tian 2020). There has been a growing debate on whether the pandemic has triggered an increase in consumers’ intention to purchase local and/or organic food and how this will effect food systems post-Covid-19. However, there has not been any research analyzing the reasons for these changes in consumer responses during the pandemic (Leone et al. 2020).

Our study is based on the conceptual framework provided by Campbell et al. (2020), suggesting that the pandemic induced adaptations of consumer responses due to a loss of control that some individuals felt. We decided to focus on Covid-19 related changes in consumers’ purchase intentions for local and organic food, as empirical research on local and organic food purchases during the pandemic is scarce and there is an ongoing discussion on how food systems will evolve after the pandemic (Galimberti et al. 2020). We included scales measuring ILC, LS, and ECM to further investigate factors that are likely to contribute to these changes. To do so, we use data from an online survey that was conducted in May 2020 among a sample of 1000 consumers in Bavaria, Germany. Thereby we add to the limited, yet growing, body of socio-economic research on the reasons underlying changes in consumer behavior during the pandemic, as we gain comprehensive knowledge on the selected constructs in this new context. Since locus of control and LS have rarely been applied in food and consumer economic research so far, the analysis of these measures is based on a careful development of hypotheses considering sources that have applied these measures in different contexts before.

The subsequent section gives a literature overview on Covid-19 related changes in food choice behavior. Next, the hypotheses are developed which make up the conceptual background of our study. In the section on material and methods the set-up of the survey is presented, the scales are explained, the sample is described and the statistical analyses are introduced. After that the results of this study are shown, which are then discussed and related to findings of other studies. Implications and limitations conclude the paper.

2. Current research on Covid-19 related changes in food choice behavior

The outbreak of the Covid-19 pandemic as well as the associated measures have led to changes in consumers’ food choice and consumption behavior. McFadden and Malone (2020) and Schmidt et al. (2020) reported that US consumers had become increasingly interested in producing their own foods as well as sourcing food locally during the pandemic. According to these authors, the shift to home-cooked meals has resulted in increasing sales for local food suppliers, maybe due to stock-outs and the concern of getting in contact with many people in large retail outlets, or the increasing time available for searching out and preparing food. In the study by Busch et al. (2020) about a quarter of the respondents maintained that they had built up stocks, and most of them reported to do so because they wanted to stay home as much as possible to protect other people, followed by the fear of an infection in a supermarket. Kirk and Rifkin (2020), however, identified hoarding behavior as a type of reactance in the early phase of the Covid-19 pandemic, because a threat of product availability was experienced as a loss of control by consumers. Hobbs (2020) reported that due to early stock-outs and large crowds at supermarkets, many consumers turned to smaller stores within their communities. Some consumers’ interest in local food might have increased and could further increase in the near future, as the demand for local food products revealed to be an established trend resulting from consumers’ economic, environmental, social, and health related motivations, which might at least partly grow in relevance during the Covid-19 pandemic (Hobbs 2020). However, Hobbs (2020) also claimed that this boost of local food supply chains may only persist in the short to medium term, since price and convenience are strong drivers for food choices, which can be more easily satisfied in conventional retail outlets for the majority of consumers.

Concerning the relevance of certain food product qualities during the pandemic in Germany, 48.0% of the respondents in a study by Busch et al. (2020) from April 2020 stated that a stable shelf life has become (much) more important, followed by healthy foods (39.7%), regional origin (38.4%), good taste (35.4%), country of origin of food (35.2%), lower prices (30.1%), and organic food (21.6%). Another study with German consumers by Kläver, Profeta, and Kirchner (2020) revealed that 12.0% of the respondents purchase more food from local producers than before Covid-19 and that only 7.0% of the respondents stated to buy more organic food than before. In the survey by Forsa Politik- und Sozialforschung GmbH (2020) 82% of the respondents attached more importance to the regional origin of food products, revealing large differences between the studies presented here.

Independent of the exact numbers, an amplification of the trend for more sustainable food consumption has been revealed, guiding speculations about whether the pandemic holds the potential to be a catalyst for moving away from a growth-oriented economy towards more sustainable consumption practices (Kirk and Rifkin 2020; Galimberti et al. 2020; GRF, 2020). Results of a study by Gerhold (2020) of the German population at the end of March 2020 showed that most people in Germany perceived the Covid-19 pandemic as a global crisis, which will affect people for a long period of time. Interestingly, the respondents did not worry much about being infected themselves, but were rather afraid of the general consequences of this crisis (Gerhold 2020).

3. Conceptual framework and development of hypotheses

So far, consumer research dealing with adaptations of behaviors due to the Covid-19 pandemic suggests that consumers experience a loss of control, which they try to compensate by choosing products that help them to regain control (Campbell et al. 2020; Kirk and Rifkin 2020). The Social Cognitive Theory (Bandura 1989) includes self-efficacy, which is a concept that refers to a person’s perceived ability or confidence to perform a certain behavior (Ajzen 2002). As such it refers to a person’s expectations about the control of certain behavioral outcomes (Cleveland, Kalamas and Laroché 2012). Social Cognitive Theory has been used to explain human behavior in very different contexts. Lin and Hsu (2015) have applied the theory to green consumer behavior and were able to show that there is a significant positive relation between self-efficacy and green consumer behavior. Self-efficacy is very similar, or even synonymous, to perceived behavioral control, which is one element of the well-known Theory of Planned Behavior (Ajzen 2002). Both, self-efficacy as well as perceived behavioral control are important predictors of behavioral intentions in studies on consumer behavior. In contrast to these two dimensions, locus of control implies that people either believe that events in their lives are caused by their own actions or by factors beyond their control (Ajzen 2002), as such locus of control relates to the actual control beliefs about outcomes and appears to be more stable across varying behaviors and situations (Cleveland et al. 2012; Hanss and Doran, 2019). Weiner, Lisspers, Ahlström and Lipsanen (2017) report that locus of control has been found to correlate with environmentally responsible behavior and behavioral intention in multiple studies. With regards to consumers’ food choices, self-efficacy or perceived behavioral control have been researched extensively as predictors of consumers’ intentions and behaviors. In food-related research, locus of control is often studied with regards to healthy eating behaviors and in many cases a domain-specific health locus of control scale has been used (e.g. Lee, Chang, Cheng and Chen, 2018) which goes back to Wallston et al. (1978). The theoretical contribution of this study is two-fold. First, there is a need to enhance theory by investigating the role of locus of control as a predictor of consumers’ intentions to choose certain foods. Second, it is also important to reveal the relevance of locus of control in the context of the pandemic, as adaptations of consumers’
behavioral responses are expected due to a perceived loss of control.

In this study the non-domain-specific scale to measure locus of control was chosen, because local and organic food choices are neither studied in a healthy eating context nor in a pro-environmental behavior context, but in more general terms in this study. The concept of locus of control of reinforcement was originally introduced into personality psychology by Rotter (1966) as an element of learning theory and deals with the generalized control expectations on the ability to self-determine occurrences in one’s life. Internal locus of control (ILC) and external locus of control (ELC) turned out to be important explanatory variables of behavior, if there was a relation between incidents in the environment and individual behavior. They are also relevant for behavior in times of insecurity and preventive behavior, such as health-related behaviors (Jakoby and Jacob, 2001). High ILC implies that people expect they can determine the course of their life through their individual behavior. People with high ELC believe that they cannot influence or determine the course of their life through their own behavior, instead they rather believe in coincidence and fortune as well as external influences from the environment that determine their life.

An underlying assumption in a study by Steptoe and Wardle (2001) was that people with high internal health locus of control will engage in health-promoting activities. The authors were able to show that high ILC was associated with an increased likelihood of “healthier” behaviors (e.g. low salt consumption or eating fibre). Additionally, Seipel (1988) reports that people with higher ILC tend to take steps to improve their environment pro-actively and experience their situation as more favorable compared to people with low ILC.

Transferring these findings to a Covid-19 related context, one can conjecture that people with a high ILC will be more prone to engage in food choices that counteract the negative health and economic consequences through Covid-19. On the one hand, this might apply to food purchases which aim at supporting the local economy, on the other hand it was also supported by their own results. In their study, locus of control significantly improved the prediction of LS and ILC was positively correlated with LS. Furthermore, the authors showed that LS was increasing with age (Hong and Giannakopoulos, 1994). Likewise, Seipel (1988) showed that respondents scoring high on ILC reported a great LS in a study on Korean immigrants.

The above-mentioned results suggest that ILC is a good predictor of LS and lead to the following hypothesis:

**H2: ILC positively influences LS.**

Several studies showed that LS and food choices are connected, with a common focus on healthy foods (Grant, Wardle and Steptoe 2009; Blanchflower, Oswald and Stewart-Brown 2013; Wahl, Villinger, König et al., 2007; Liu and Rist 2020). The study by Grant et al. (2009) focused on the relation between LS and seven health-related behaviors, namely smoking, alcohol consumption, sun protection, physical exercise, fruit intake, fat avoidance, and fiber intake. The authors were able to reveal a relation between LS with all health behaviors under study, but fiber intake and alcohol consumption. The authors also showed that the association between LS and health-related behavior is not mediated through health motives alone, but through a variety of factors, such as, social interaction and enjoyment of sport for physical activity as one health-related behavior, respectively price or convenience for food-related behavior (Grant et al. 2009). Transferring these results to the food-related (Covid-19) research context suggests an examination of the relation between LS and changes in food choice or consumption behavior and how it is mediated through FCM. In other words, FCM were included as mediators, because it is expected that they account for part of the relation between LS and consumers’ purchase intention for local and organic food. The FCM used in this study are selected from the food choice questionnaire (FCQ) by Steptoe et al. (1995), which was developed as a multidimensional measure of motives related to food choice. We chose four FCM, namely health, natural content, ethical concern, and price, because they are important motives for organic and local food choices (Feldmann and Hamm, 2015; Hasselbach and Roosen 2015).

Based on these theoretical considerations the following hypotheses are deduced:

**H3a: The association between LS and the increasing attention to the origin of food during the Covid-19 pandemic is mediated through the FCM (1) price, (2) natural content, (3) ethical concern, and (4) health.**

**H3b: The association between LS and the increasing attention to organically produced food during the Covid-19 pandemic is mediated through the FCM (1) price, (2) natural content, (3) ethical concern, and (4) health.**

The overall aim of this study is to reveal how ILC relates with consumers’ increased willingness to purchase locally produced food and the increased importance attached to organically produced food during the Covid-19 pandemic as well as the influence of ILC on LS and the mediating effects of FCM on the association between LS and both dependent variables.

4. Material and methods

4.1. Questionnaire design

A questionnaire was developed to get general information on Covid-19 related changes in food choice and consumption behavior as well as some more general behavior changes and fears concerning the future. A scale to measure internal and external locus of control (Jakoby and Jacob, 2001), the satisfaction with life scale (Diener et al. 1985) and four FCM from the FCQ by Steptoe, Pollard and Wardle (1995) were also part of the questionnaire. None of the items in these scales were changed or adapted to the context of the pandemic.

For the measurement of locus of control, a six-item scale was used, reflecting internal (ILC) and external locus of control (ELC) (Jakoby and Jacob, 2001). This binary scale was validated with two big samples in 1995 and 1996. Cronbach’s alpha, as a measure for reliability and internal consistency, was 0.71 and 0.62 for ILC and only 0.58 and 0.64 for ELC. The original scale is German and was also used in German in the questionnaire underlying this study. For the purpose of this publication all items were translated into English. A five-point Likert scale was used, following the recommendation by Jakoby and Jacob (2001). All items belonging to this scale are presented in Table 1 in the results section. In this study, Cronbach’s alpha of ELC was below 0.7 and was therefore excluded from further analyses.

A five-item scale for the measurement of LS was adopted from Janke and Glockner-Rist (2012). The scale was originally developed by Diener et al. in 1985 and translated into German by Schumacher (2005). A list of 48 items builds the basis, from which five were identified as the most precise and distinct items to measure LS. These five items were presented to three different samples to test for validity and reliability (Diener et al. 1985). The scale has been translated into 26 languages. Although the authors recommended to use a seven-point Likert scale, a five-point Likert scale was applied in this study for reasons of consistency since all other scales were measured on five-point Likert scales as well. All five items used to measure LS are presented in Table 1 in the results section.

The FCM used in this study are based on the FCQ developed by
Table 1

Measurement model of the latent constructs used in this study (all measured on a 5-point rating scale; CB’s α: Cronbach’s alpha, CR: composite reliability, AVE: average variance extracted, MSV: Maximum Shared Variance).

| Scales and items | Standardized factor loadings | CB’s α | CR | AVE | MSV |
|------------------|------------------------------|--------|----|-----|-----|
| Life satisfaction |                              |        |    |     |     |
| In most ways my life is close to my ideal. | 0.858 | 0.894 | 0.897 | 0.637 | 0.197 |
| The conditions of my life are excellent. | 0.894 | 0.894 | 0.894 | 0.637 | 0.197 |
| I am satisfied with my life. | 0.786 | 0.786 | 0.786 | 0.551 | 0.197 |
| So far I have gotten the important things I want in life. | 0.750 | 0.750 | 0.750 | 0.551 | 0.197 |
| If I could live my life over, I would change almost nothing. | 0.685 | 0.685 | 0.685 | 0.488 | 0.197 |
| Internal locus of control |                              |        |    |     |     |
| I like to take on responsibility. | 0.734 | 0.734 | 0.740 | 0.488 | 0.197 |
| It has proven good for me to make decisions myself, instead of relying on fate. | 0.757 | 0.757 | 0.757 | 0.551 | 0.197 |
| If I encounter problems and opposition, I usually find ways and means to carry my point. | 0.662 | 0.662 | 0.662 | 0.488 | 0.197 |
| Natural Content1 |                              |        |    |     |     |
| Contains no additives | 0.863 | 0.863 | 0.867 | 0.685 | 0.691 |
| Contains natural ingredients | 0.793 | 0.793 | 0.793 | 0.685 | 0.691 |
| Contains no artificial ingredients | 0.852 | 0.852 | 0.852 | 0.685 | 0.691 |
| Ethical Concern |                              |        |    |     |     |
| Has the country of origin clearly marked | 0.752 | 0.752 | 0.752 | 0.685 | 0.691 |
| Is packaged in an environmentally friendly way | 0.733 | 0.733 | 0.733 | 0.685 | 0.691 |
| Health |                              |        |    |     |     |
| Contains a lot of vitamins and minerals | 0.842 | 0.842 | 0.847 | 0.484 | 0.579 |
| Keeps me healthy | 0.779 | 0.779 | 0.779 | 0.644 | 0.383 |
| Is nutritious | 0.799 | 0.799 | 0.799 | 0.644 | 0.383 |
| Is high in protein | 0.617 | 0.617 | 0.617 | 0.551 | 0.383 |
| Is good for my skin/teeth/hair/nails etc | 0.720 | 0.720 | 0.720 | 0.685 | 0.691 |
| Price |                              |        |    |     |     |
| Is not expensive | 0.887 | 0.887 | 0.887 | 0.730 | 0.484 |
| Is cheap | 0.821 | 0.821 | 0.821 | 0.730 | 0.484 |

Model fit statistics: Chi^2 = 639.27, df = 174, RMSEA = 0.052, CFI = 0.955, SRMR = 0.038.

1 The items of the four FCM are implemented as follows: “It is important to me that food which I eat on a daily basis...”. The items “comes from countries I approve of politically” (ethical concern) and “is good value for money” (price) were removed because of low factor loadings.

4.2. Data collection and sample characteristics

Data for this study was collected by a private market research company, via its online access panel, from May 29th to June 6th in Bavaria, the largest federal state in Germany in terms of area. Those respondents who stated not to be responsible for grocery shopping at all and those younger than 18 years of age were screened out. Quotas were specified for gender, age, education, employment status and household size to obtain a sample that is as close to the general population as possible. No further sampling techniques or criteria were applied. The final sample consisted of 1007 respondents; the main characteristics are presented in the appendix (Appendix A).

Bavaria was the federal state with the highest number of Covid-19 cases, most cases per 100,000 inhabitants, and the highest number of deaths (in total as well as per 100,000 inhabitants) at the time of the survey in Germany. However, at the time of the survey the Robert Koch Institute (2020), that is Germany’s Public Health Institute, reported a mild level of the disease, with a risk of infection heavily depending on regional spread, living conditions, and individual behavior.

4.3. Data analysis

The analytical procedure followed in this study is to a large extent based on structural equation modelling (SEM). SEM is a statistical technique that is commonly applied in the behavioral sciences to test hypotheses about relations. It can be used to specify confirmatory factor analysis models, regression models, and complex path models. The relations between theoretical constructs are presented by regression (or path) coefficients (Hox and Bechger 1999).

We first carried out a confirmatory factor analysis (CFA) in SPSS Amos 26 to verify the factor structure of the selected dimensions before using them for further analyses. CFA is a type of structural equation modeling that deals with the relationships between observed measures or items and latent variables, respectively factors. The goal of establishing such a measurement model is to shed light on the number and nature of factors that account for the variation and covariation among a set of variables (Brown & Moore, 2012). The measurement model is also applied to check for discriminant and convergent validity by considering composite reliability, average variance extracted, and maximum shared variance of all latent factors. In addition, several model fit parameters are considered.

In contrast to an exploratory factor analysis, a path diagram is specified that represents a clear hypothesis about the factor structure. The items that account for each of the selected dimensions were implemented as observed variables, while the dimensions were drawn as latent factors. The arrows from the factors to the variables represent the factor loadings (or regression coefficients). In addition, each observed variable was linked to a residual error term, because the latent factors are not able to completely explain the observed variation. Furthermore, one of the factor loadings of each latent factor needed to be fixed to one, because the scale of the factor would have been underdetermined otherwise (Hox and Bechger 1999). The model was estimated using the maximum likelihood method, which is based on the idea of drawing...
5. Results

5.1. Confirmatory factor analysis and validation of measures

The latent constructs used in this study were validated through a confirmatory factor analysis (CFA) by establishing a measurement model (Table 1). Two items were excluded from the analysis because of their low factor loadings (note: these are crossed out in Table 1 for clarification), LS showed a high internal consistency (Cronbach’s alpha: 0.894), which is similar to that reported by Diener et al. (1985) in their study on the satisfaction with life scale. ILC revealed a comparably low value for Cronbach’s alpha, which reflects the results by Jakoby and Jacob (2001). However, it is above 0.7 and hence regarded as acceptable (Tavakol and Dennick 2011). The Cronbach’s alpha values of the FCM achieved in this study are above 0.7 as well and quite similar to the values revealed by Steptoe, Pollard, and Wardle in their initial study from 1995. In addition to Cronbach’s alpha, composite reliability was also measured for all constructs (column 4, Table 1) and confirms that the internal consistency and reliability of the measurement scales is satisfying (Tavakol and Dennick 2011). The average variance extracted (AVE) reveals values above 0.5 for all constructs, except for ILC and the FCM health (column 5, Table 1). Values below 0.5 indicate that there is an issue with convergent validity (Hair, Black, Babin and Anderson 2010), i.e. not all items reflect the intended construct. However, Fornell and Larcker (1981) state that AVE values above 0.4 are acceptable, in case composite reliability is above 0.7. As this requirement is met, convergent validity is of ILC and the FCM health is still adequate in this study. Nevertheless, there is an issue concerning discriminant validity (i.e. that constructs are distinct from each other) with the FCM health, natural content, and ethical concern, as maximum shared variances (MSV) are larger than the AVE for these three FCM. This validity concern is also reflected in the fairly high correlations (i.e. coefficients between 0.7 and 0.9; according to Hinkle, Wiersma & Jurs, 2003) between these constructs (Appendix B). Despite this validity issue, there are two reasons for keeping those three constructs in the study. Firstly, these three FCM were not included into the model at the same time, but separately to investigate their role as mediators (as described in chapter 4.3). Secondly, the FCM have been applied in many studies in their original form before. To guarantee comparability of the results, the item/factor structure was not adjusted.

5.2. Relation between measured constructs and sociodemographic characteristics

Mean comparisons of LS as well as ILC across sociodemographic characteristics showed that there were significant relations between age groups and LS (p = 0.019) and ILC (p = 0.016), for ILC the mean values were higher in higher age groups. Concerning LS and age, the highest mean value could be found for the age group 65+ and the lowest mean value in the age group 50–64 years. There was a significant relation between LS and education as well as occupation (p < 0.001) in that the mean values for LS were higher for higher education levels as well as for

![Fig. 1. Graphic representation of the hypotheses described above.](image-url)
full- and part-time occupation and retirement. Correspondingly, LS was also higher for respondents with higher incomes. Likewise, ILC was higher in higher income groups (p < 0.001).

Regarding the FCM, there were significant relations between gender (higher mean values for female respondents) and ethical concern (p = 0.004), health (p = 0.001), and natural content (p = 0.001). Furthermore, there were significant relations between age groups (higher mean values for respondents aged 65 + ) and ethical concern (p = 0.002), health (p = 0.004), and natural content (p = 0.014). There was also a significant relation between household size and price (p < 0.001), in that there was a higher mean value for single households as compared to households with 2 to 4 person. Moreover, the results revealed higher mean values for price in lower income groups (p < 0.001) and higher mean values for natural content in higher income groups (p = 0.005). Overall, the results show that the FCM natural content was ranked highest by the respondents, closely followed by ethical concern and health. Price was ranked lowest (Appendix B).

5.3. Results from hypothesis testing

Hypothesis 1 states that there is a significant direct link between ILC and consumers stating that they buy more locally produced food (H1a) and that they attach more importance to organically produced food since the outbreak of the Covid-19 pandemic (H1b). Hypothesis 2 implies that ILC positively influences LS. Two models were set up, one containing the single-item variable Q1 (“I buy more locally produced food than before the Covid-19 pandemic”) as the dependent variable and the other one containing the single-item variable Q2 (“I attach more importance to the organic production of food items”) as the dependent variable. The model fit parameters for both models are presented in Table 2, indicating a good fit of these two models.

Table 3 gives an overview on the unstandardized coefficient estimates and standard errors from models 1 and 2 for testing H1a and H1b as well as H2. As there is a positive and significant relation between ILC and Q1 (“I buy more locally produced food than before the Covid-19 pandemic”) (0.253**), H1a is accepted. H1b, however, is rejected, as the relation between ILC and Q2 (“I attach more importance to the organic production of food items”) is not significant (0.139). Furthermore, the results show that ILC positively influences LS (0.550**), as stated in H2. Hence, H2 is accepted as well. In addition, positive and significant relations between LS and both dependent variables are revealed (0.118** and 0.198**). The results regarding the sociodemographic variables show that income and age significantly influence ILC (0.056** and 0.005**) and that income additionally influences LS (0.135**). These relations are positive, but very weak in all three cases.

The standardized total, direct, and indirect effects are displayed in Table 4. The total effects are the sum of the corresponding direct and indirect effects. The rows reveal the determinants, while the dependent variables are placed in the columns. While the estimates presented in Table 3 are unstandardized, these estimates are standardized and therefore allow for comparisons. The results show that there is a positive and moderate effect of ILC on LS (0.398). Comparing the effects of ILC and LS on both dependent variables, a stronger effect of LS on Q2 (“I attach more importance to the organic production of food items” (0.140) than on Q1 (“I buy more locally produced food than before the Covid-19 pandemic” (0.083) can be revealed, whereas this is the other way around for ILC (0.162 for Q1 and 0.127 for Q2). In addition, the indirect effect of ILC on Q1 via LS (0.033) is smaller than the indirect effect of ILC on Q2 via LS (0.056). The direct effect of ILC on Q1 (0.129), however, is larger than the direct effect of ILC on Q2 (0.071).

Hypotheses 3a and 3b indicate that the FCM health, ethical concern, natural content, and price mediate the association between LS and both dependent variables Q1 and Q2. At first, the direct links between LS and both dependent variables are consulted. For the dependent variable Q1 the model yields an unstandardized estimate of 0.200** (SE: 0.046; standardized estimate: 0.141), for the dependent variable Q2 the unstandardized estimate is 0.241** (SE: 0.046; standardized estimate: 0.170). Both relations between LS and the dependent variables are positive and significant.

In order to reveal mediating effects, the FCM are individually included as mediators in these two paths. Tables 5 and 6 include the Standardized Root Mean Square (SRMR) as one model fit parameter and the unstandardized and standardized estimates for the above-mentioned paths for all four presumed mediating variables (rows) and both dependent variables (columns). The SRMR values indicate good model fit for all models tested (first column). Referring to the criteria proposed by Baron and Kenny (1986), all estimates for the paths between LS and the four FCM (the presumed mediating variables) are significant (Table 5 and 6: third column LS – FCM). Likewise, the estimates for the paths between the presumed mediating variables and both dependent variables are significant (Table 5 and 6: fourth column FCM – Q1 respectively Q2). However, the estimates for the paths between LS and both dependent variables remain positive and significant in all eight cases (Table 5 and 6: second column LS – Q1 respectively Q2). Hence, the third condition proposed by Baron and Kenny (1986) cannot be met and it can be concluded that none of the four FCM is a full mediator in the relation between LS and Q1 (“I buy more locally produced food than before the Covid-19 pandemic”) as well as LS and Q2 (“I attach more importance to the organic production of food items”). Nevertheless, according to Baron and Kenny (1986) and Gunzler et al. (2013) a significant reduction of the path between the independent and the dependent variable through the inclusion of a mediating variable, hints at a partial mediator. Since all direct links between the independent variable LS and the dependent variables are reduced through the inclusion of one of the FCM, it can be concluded that the FCM are partial mediators for the association between LS and the two dependent variables. The direct as well as the indirect effects of LS on the two dependent variables are significant (Table 5 and 6: column 6 LS – Q1 respectively Q2 indirect). Hence, hypotheses 3a and 3b are accepted.

The direct single links between LS and the three FCM health, ethical concern, and natural content are positive and significant as well as the links between those three FCM and the two dependent variables (“I buy more locally produced food than before the Covid-19 pandemic” and “I attach more importance to the organic production of food items”). The direct single links between LS and the FCM price as well as between the FCM price and the two dependent variables are significant and negative (Table 5 and 6: columns 3 and 4). The standardized estimates for the relations between the FCM and the dependent variable Q2 referring to the importance attached to organically produced food are consistently higher than those for the links between the FCM and the dependent variable Q1 (Table 5 and 6: column 9 FCM – Q1 respectively Q2). Hence, the FCM health, ethical concern, natural content, and price more strongly influence the importance attached to organically produced food than the willingness to purchase locally produced food.

6. Discussion

The basic idea of analyzing consumers’ responses to the disruptions caused by the pandemic and investigating consumers’ locus of control...
stemmed from the conceptual framework introduced by Campbell et al. (2020) and a lack of empirical research on changes in local and organic food consumption during the pandemic. The investigated hypotheses were derived from a thorough review of literature on the relevant dimensions. A comparison was drawn between locus of control and the two dimensions, self-efficacy and perceived behavioral control, which are commonly used predictors of behavioral intentions in studies on consumer behavior, as they are part of the Social Cognitive Theory and the Theory of Planned Behavior. Locus of control, however, is not often applied in consumer studies related to food. This study contributes to the literature, in that it shows the positive relation between ILC and changes in consumer’s intention to purchase local food. However, this does not hold true for the intention to purchase organic food. Suhr (2006) stressed that careful development of a theoretical model prior to SEM data analysis is critical to obtain reasonable results. The overall good model fit parameters in this study indicate that parameters and the paths between parameters were chosen wisely, leading to the conclusion that we achieved to successfully apply ILC and LS in a food-related consumer research context.

The results of this study reveal a positive relation between ILC and the intention to purchase more locally produced food than before the Covid-19 pandemic. Interestingly, a positive relation between ILC and the importance of organically produced food could not be revealed. Putting this finding into the context of the Covid-19 pandemic, reveals that the intention to purchase more local food can be viewed as one adaptation of consumer behavior in response to uncertainty and a loss of control for example with regard to disrupted supply chains, as proposed by Campbell et al. (2020) and Kirk and Rifkin (2020). Regarding organically produced food, this relationship might not equally hold true, because there are no positive effects of organic food purchases which directly mediate negative consequences of the Covid-19 pandemic and restore consumers’ loss of control. Hence, respondents with high ILC either do not regard organic food products as beneficial for their health in times of a pandemic or are less concerned about their individual health than about the economic consequences. The latter reasoning is supported by findings from Busch et al. (2020) and Gerhold (2020).

Further interesting insights can be gained from the influence of sociodemographic variables on LS and ILC. Older respondents appear to have a higher ILC, indicating that older people rather have the feeling that they can influence the outcome of occurrences in their life, while younger people believe that their own behavior does not matter much and rewards in life are generally outside of their control. Concerning LS and age, the picture is not as clear. While people aged 65 + appear to be most satisfied, people between 50 and 64 years of age are the least satisfied with their life. A possible explanation could be the significant relation between retirement and higher LS. However, LS is also high for people in full- and part-time occupation, which might be due to the financial rewards in life are generally outside of their control. Concerning LS and age, the picture is not as clear. While people aged 65 + appear to be most satisfied, people between 50 and 64 years of age are the least satisfied with their life. A possible explanation could be the significant relation between retirement and higher LS. However, LS is also high for people in full- and part-time occupation, which might be due to the financial

Table 3
Unstandardized estimates and standard errors to investigate the influence of ILC on LS, and the relation between ILC and Q1, ILC and Q2, **p < 0.01.

| ILC  | LS  | Q1  | Q2  |
|------|-----|-----|-----|
| ILC  | 0.550** | 0.054 | 0.253** | 0.083 |
| LS   | 0.119*  | 0.054 | 0.139  | 0.082 |

Note: SRMR for the link between LS and Q2 without a mediating variable is 0.027.

Table 4
Standardized total, direct, and indirect effects to investigate the influence of ILC on LS, and the relation between ILC and Q1, ILC and Q2.

| ILC  | LS  | Q1  | Q2  |
|------|-----|-----|-----|
| ILC  | 0.398 | 0.162 | 0.127 | 0.083 |
| LS   | 0.083 | 0.140 | 0.055 | 0.066 |
| Income | 0.178 | 0.383 | 0.018 | 0.012 |
| Age  | 0.031 | 0.043 | 0.001 | 0.004 |
| Gender | 0.398 | 0.129 | 0.071 | 0.140 |

Table 5
Unstandardized estimates (standard errors in parentheses) and standardized estimates for the different paths to investigate the mediating effect of FCM between LS and Q1, **p < 0.01 and *p < 0.05.

| Model fit | Unstandardized estimates | Standardized estimates |
|-----------|--------------------------|------------------------|
| ILC       | LS – Q1                  | LS – Q1(direct)       |
| S RMR     | 0.139**(0.042)           | 0.131**(0.026)        |
| Health    | 0.304**(0.052)           | 0.304**(0.040)        |
| Ethical concern | 0.304**(0.040) | 0.094 | 0.040** |
| Natural content | 0.245**(0.043) | 0.094 | 0.036** |
| Price     | 0.108                   | 0.016*                 |
| Note: SRMR for the link between LS and Q1 without a mediating variable is 0.023. |

Table 6
Unstandardized and standardized estimates for the different paths to investigate the mediating effect of FCM between LS and Q2, **p < 0.01.

| Model fit | Unstandardized estimates | Standardized estimates |
|-----------|--------------------------|------------------------|
| ILC       | LS – Q2                  | LS – Q2(indirect)     |
| S RMR     | 0.149**(0.045)           | 0.166**(0.030)        |
| Health    | 0.551**(0.056)           | 0.088                 |
| Ethical concern | 0.596**(0.061) | 0.088 | 0.082** |
| Natural content | 0.466**(0.045) | 0.091 | 0.079** |
| Price     | 0.099                   | 0.072**               |
| Note: SRMR for the link between LS and Q2 without a mediating variable is 0.027. |
security, as there is also a significant relation between LS and income. Moreover, ILC is higher in higher than in lower income groups, revealing that with the level of income, the feeling to have control over what happens in their life increases.

While ILC only reveals a positive influence on the increased willingness to purchase locally produced food, LS shows a positive relation with both, the increased willingness to purchase locally produced food as well as with the increased importance attached to organically produced foods. However, LS has a stronger positive relation with the intention to purchase more organic food than with the intention to purchase more local food, indicating that consumers who experience more satisfaction with their lives attach more importance to organically produced food items. In addition, the study reveals that the FCM health, ethical concern, natural content, and price act as partial mediators on the increased purchase of locally produced food as well as the increased importance attached to organically produced food since the outbreak of the Covid-19 pandemic. Hence the FCM account at least partly for the relation between LS and purchase intentions for local and organic food. This mediating effect was hypothesized due to the findings from Grant, Wardle, and Steptoe (2009) who focused on the link between LS and health-related behavior.

The insights gained from this study indicate that people with a high ILC are better able to cope with the Covid-19 pandemic, since they proactively engage in behavior to mitigate negative consequences and thereby believe that they have some control on how the pandemic is developing. Furthermore, they are more likely to be satisfied with their life in general, which is a good prerequisite to cope with a crisis. Hence, policy measures should address the fears of people with lower ILC and confirm them, in that their individual behavior can also have an effect. Thereby, they would feel encouraged to believe that they themselves can influence the outcome of incidents in their life, instead of just chance or fate. Moreover, the study shows that consumers’ growing interest in local food sourcing during the pandemic is related to personality factors, which trigger different coping strategies with the constraints experienced during the pandemic. This finding implies that the continuation of local food purchases post-Covid-19 will also depend on consumers’ personality which should be taken into account when debating the future development of food systems. Hence, not all consumers who showed more interest in the origin and production standards of food, will continue to do so after the Covid-19 pandemic is over. The pandemic can only serve as a catalyst for more sustainable behaviors, if it will be framed by marketing and policy measures which support consumers in their sustainability activities.

6.1. Future research

In the future, it would be especially interesting to compare the role of locus of control in other food and consumption-related studies during, but also after the Covid-19 pandemic, between different countries as well as federal states in Germany. In addition, a comparison of the predictive power of self-efficacy and locus of control in studies on consumer behavior would be a valuable contribution to theory. Further research also needs to be carried out to investigate, if other FCMs will also mediate the link between LS and changes in purchase intentions for local and organic food during the Covid-19 pandemic (cf. Markovina et al. (2015) who recommend to use the original 36-item version of the FCM). In addition, research could be done on the mediating effect of the FCM between LS and other changes in food choice and consumption behavior.

6.2. Limitations

The scope of this study is limited with regard to the changes in food choices, which only cover the purchase of locally and of organically produced food items. In addition, this study is survey-based and as such only deals with consumers’ self-reported behaviors, which most likely differ from consumers’ real purchase behaviors.

Concerning the FCM, this study is limited in that only four out of nine FCM were selected, because they appeared to be most appropriate in the context of this study. If this research approach is transferred to other contexts, different FCM might be appropriate depending on the research topic under investigation. Furthermore, the discriminant validity issue needs to be addressed in future studies as well.

Further limitations of this study are the focus on a Bavarian sample as only one federal state in Germany. Moreover, the study was carried out at a time, when the rather strict Covid-19 measures had already been relaxed. Hence, at an earlier point in time, the results might have been slightly different.

Concerning theory building, more research on locus of control and LS in food- and consumer-related research contexts is necessary to establish a theoretical framework that includes both measures to predict changes in food choice and consumption behavior in times of a crisis as well as under normal conditions.

7. Disclosure

7.1. Author statement

This work was supported by the Bavarian State Ministry for Food, Agriculture and Forestry. The funding source was not involved in any step from the study design to the decision to submit the article for publication.

CRediT authorship contribution statement

Corinna Hempel: Conceptualization, Methodology, Investigation, Data curation, Writing – original draft, Writing – review & editing, Visualization. Jutta Roosen: Resources, Supervision, Writing – review & editing, Funding acquisition.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix A

Sociodemographic characteristics of the sample (n = 1007)

| Sample | n   | Gender (%) |
|--------|------|------------|
|        | 1007 | female     |
|        |      | male       |
|        |      | (continued on next page) |
Appendix B

Means, standard deviations, and correlations of latent constructs.

| Sample | Mean | SD  | 1    | 2    | 3    | 4    | 5    | 6    |
|--------|------|-----|------|------|------|------|------|------|
| Age group (%) | 18-34 | 25.6 | 35-49 | 29.5 | 50-64 | 26.2 | 65+ | 18.7 |
| Occupation (%) | Employed | 49.0 | Retired | 22.3 | Part-time employed | 11.8 | Homemaker | 4.0 |
| Education (%) | Secondary school | 51.4 | University | 27.8 | General qualification for university entrance | 19.7 | No degree | 0.6 |
| Family (%) | Married | 45.3 | Single | 22.8 | Living together (not married) | 15.3 | Divorced | 9.7 |
| Household (%) | 1 | 26.0 | 2 | 43.5 | 3 | 15.1 | 4 | 12.0 |
| Size of residence (%) | <5,000 | 26.4 | 5,000-20,000 | 30.0 | 20,000-100,000 | 16.3 | >100,000 | 27.3 |
| Income (€) (%) | <1,000 | 7.0 | 1,000 ≤1,500 | 10.3 | 1,500 ≤2,000 | 13.2 | 2,000 ≤2,500 | 14.8 |
| | 2,500 ≤3,000 | 14.6 | 3,000 ≤4,000 | 20.5 | >4,000 | 19.7 |

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