



**To what extent do health and
environmental attitudes
influence the purchase behaviour
of organic food**

Submitted to David Leonard, Ph.D.

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Affidavit

I hereby affirm that this Bachelor's Thesis represents my own written work and that I have used no sources and aids other than those indicated. All passages quoted from publications or paraphrased from these sources are properly cited and attributed.

The thesis was not submitted in the same or in a substantially similar version, not even partially, to another examination board and was not published elsewhere.

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Abstract

Organic food has gained a well-established reputation in today's society as a premium product that is also seen as a better alternative to conventional food. This view is supported by the fact that it does not get manipulated by synthetic fertilizers. Other reasons for organic food are the better-perceived health benefits and a more harmless approach to the environment. Therefore, this research paper aims to determine the effects of health attitudes and environmental attitudes on the purchase behavior of organic food.

An online survey was conducted with a quantitative approach to examine this topic. The survey consisted of questions measuring purchase behavior, health, and environmental attitudes. Two open-ended questions were also asked to get greater insight. For the examination, a linear regression analysis was conducted.

The results failed to show a significant relationship between organic food consumption behaviors and the independent variables, when aggregated as the complete New Ecological Paradigm and Health Consciousness scales yet revealed that individual constructs from these scales are useful predictors of organic food consumption behaviors.

Keywords: Organic food, Purchase behavior, Health attitudes, Environmental attitudes

Table of Contents

<i>Affidavit</i>	II
<i>Abstract</i>	III
1. Introduction	1
2. Literature review	3
2.1 Organic food.....	3
2.2 Theory of Planned Behavior	5
2.3 Attitude.....	7
2.4 Health attitudes and health consciousness	8
2.5 Environmental attitude	10
2.5.1 Environmental footprint organic vs. conventional	12
2.6 Food Labels	14
3. Methodology	16
3.1 Survey development	17
3.1.1 Demographics	17
3.1.2 Purchase behavior towards organic food	18
3.1.3 Health attitudes and consciousness	18
3.1.4 Environmental attitudes	19
3.1.5 End of survey	19
3.1.6 Constructs Items Table	21
3.2 Data collection	22
3.3 Data analysis	22
4. Survey analysis	25
4.1 Sample	25
4.2 Descriptive	26
4.2.1 Proportion of meals	26
4.2.2 Percentage Meat Organic	27
4.2.3 Percentage dairy organic	28
4.2.4 Percentage bread and cereal organic	28

4.2.5 Percentage fruit and vegetables organic	28
4.2.6 Discussion of descriptive	29
4.3 Correlation Analysis	30
4.4 Linear Regression.....	32
4.4.1 Regression Model 1	32
4.4.2 Regression Model 2	34
4.4.3 Regression Model 3	36
4.5 Discussion	37
5. Conclusion and findings	38
5.1 Theoretical Implications.....	40
6. Bibliography.....	42
7. Appendices.....	47
7.1 Survey structure.....	47
7.1.1 Questions to measure the purchase behavior towards organic food	47
7.1.2 Open-ended questions	48
7.1.3 Questions to measure the environmental attitudes	49
7.1.4 Questions to measure the health attitudes/ health consciousness	50

Table of Tables

Table 1: Constructs Items Table.....	21
Table 2: Gender.....	25
Table 3: Pearson’s correlation coefficient between percentage organic food and scales	30
Table 4: Pearson’s correlation coefficient between aggregate percentage organic food and constructs.....	31

Table of Figures

Figure 1: Percentages of food categories certified organic	27
Figure 2: Linear Regression model - percentage organic food	32
Figure 3: Linear Regression model – percentage fruit and vegetables organic.....	34
Figure 4: Linear Regression model - Percentage bread and cereals organic.....	36

1. Introduction

Today's society faces several issues concerning life on this planet. To tackle these issues, the United Nations have formulated a total of seventeen development goals in the fields of social, economic, and environmental sustainability (United Nations, 2022). Many of these goals are intertwined, and in the context of food production methods, the goals concerning health and wellbeing, climate change, and life on land are targeted. In this process, the consumer has a significant part in ensuring the success of these goals.

Consumers attitudes towards the environment and their health play a crucial role in their buying behavior today. These attitudes especially play a larger role when it comes to the food consumed. In this context, organic food increasingly gains in weight as it is most often associated with being influenced by environmental as well as health attitudes and consciousness (Kusumaningsih et al., 2019).

Ghufran et al., (2022) defined organic food and concluded that it involves food that has been grown, processed, and delivered to the consumer passed via environmental safeguards, preserving biodiversity and without the use of artificial help.

This research therefore puts environmental attitudes and health attitudes into perspective with consumer purchase behavior, which is defined by Delafrooz et al., (2014) as the "final consumer behavior" and aims to determine their effect on each other.

To measure the consumers environmental attitudes, the New Ecological Paradigm Scale (NEP) has proven effective (Anderson, 2014) as a validated scale to measure environmental attitudes that has already been used by many well-established researchers before.

A set of questions regarding the general attitude of consumers towards their health has also been established to measure health consciousness. These questions were retrieved from previous research that has proven effective in determining health consciousness.

A survey will examine the two assumptions to gain insight into the topic. The literature will elaborate more on the topic and understand the connected

strings, where further definitions of terms will be provided to understand the report better. The methodology will also guide the research process and help outside persons understand and replicate the research. The last step will include the data processing, where the data is analyzed, and the results and assumptions are tested.

The following research questions will be examined throughout the survey:

1. To what extent do environmental attitudes affect the purchase behavior of organic food?
2. To what extent do the constructs within environmental attitudes affect the purchase behavior of organic food?
3. To what extent do health attitudes affect the purchase behavior of organic food?
4. To what extent do the constructs within health attitudes affect the purchase behavior of organic food?

This paper's literature review will first detail organic food with a small excursion into sustainable agriculture, its link to organic agriculture, and its difference from conventional food—subsequently, the theory of planned behavior. The final chapter comprises the topics of health and environmental attitudes.

This research is especially exciting for companies operating in the organic food market, wanting to understand the motives behind organic food consumption. This research will thereby be helpful in determining their marketing strategy and finding out whether to focus more on health or environmental facts when promoting their product.

2. Literature review

The essential terms of this research paper are consumer behavior, health attitudes, and environmental attitudes. Understanding these terms and their connection to organic food for the purpose of this research is thereby implied. The following sections of the literature review will precisely provide this understanding. The first paragraph will give a brief insight into the importance of organic food and what differentiates itself from non-organic food. The sections after will deal with consumer behavior supported by the theory of planned behavior and the decision-making stages. Afterward, the term attitude with a follow-up to health and environmental attitudes is defined. The final part will deal with the importance of food labeling for organic food, taking health and environmental attitudes and their influence on purchase behavior into account.

2.1 Organic food

The organic food market has gained momentum in past years and is one of the fastest-growing markets in developed economies such as the European Union (Chen, 2007). Globally, the market has been sixfold from the beginning of the century until two thousand seventeen, from roughly sixteen billion to a hundred billion in sales, according to Willer & Lernound., (2019), cited in Dorce et al., (2021). This increase in demand for organic food indicates how the prospect of organic food will develop. The reason for continuously more people wanting to buy organic food varies. To better understand this topic, the first step toward understanding organic food is to define what it is. Organic food does not get modified by synthetic fertilizers and other pesticides. It grows in safe soils and must get separated from conventional processed food. Singhal, (2017, p.46) went on to specify that the use of "synthetic pesticides, bioengineering genes, Genetically Modified Organisms (GMO), petroleum-based fertilizers, and sewage sludge-based fertilizers" are prohibited from being used for organic food.

According to Massey et al., (2018), the intention to purchase organic food can be traced back to its higher quality than conventional food. This perceived difference is also a driver of the demand for this product. The organic food market is often associated with the search, experience, and credence attributes. According to Fernqvist & Ekelund, (2014), search includes attributes discovered in a product before buying or consuming the good, while experience is the attribute of discovering a product's difference after buying and consuming the good. On the other hand, credence attributes are the differences that are not verifiable even after the product is consumed. These different attributes explain the organic food market and the demand for the products. The market is therefore called a credence goods market.

When it comes to the differences in nutrients on paper, researchers have found out that there is no significant difference of organic food compared to conventional food. A report by a leading pharmaceutical company called Bayer (Bayer Canada, 2022) investigated a study conducted at Stanford, which included a sample of 250 studies that analyzed the difference in nutrition between organic and non-organic food. The study concluded that there was no noteworthy difference in nutrition. However, the single difference in the study was a tiny, more significant remainder of pesticides in the non-organic food, which was in the acceptable range. Clark & Tilman, (2017) see the difference between organic and conventional food within its nutrient management techniques.

Where organic food may only get processed with Manure, non-organic food may receive support from synthetic fertilizers. To gain a better understanding, working with Manure lets the farmer only rely on environmental conditions for the plant to grow and not on the required mediums the plant needs to grow effectively. The use of Manure as fertilizer often leads to miss growth in the plants and requires a higher labor and land input to keep up with the output of non-organic food. This aspect does not indicate that non-organic food is a better alternative, as non-organic food has a higher energy output and requires more pesticide and other fertilizer inputs. These can potentially have adverse results on human health, according to Townsend, (2003) and Schwarzenbach

et al., (2010), cited in Clark & Tilman (2017), and the environment (Vitousek et al., 2009, Foley et al., 2011, cited in Clark & Tilman, 2017). In addition to possible adverse health results, modern agricultural practices are under pressure due to more people engaging with environmental issues (Chen, 2007). These issues shed light on health and environmental attitudes, being the two major concerns connected with organic and non-organic food. And, where there are no direct nutritional differences between these two food practices on paper, consumers' reason for choosing either lies in their attitudes and buying behavior. The following paragraphs will try to understand consumer behavior based on the theory of planned behavior and then detail how their health and environmental attitudes influence this behavior.

2.2 Theory of Planned Behavior

As mentioned in the previous paragraph, a significant part of this thesis is to understand people's behavior in the purchase behavior of organic food. It is thereby essential to understand the basis of human behavior. A theory conceptualized by Ajzen, (1991) which has become one of the most widely used concepts in the social and behavioral sciences and cited in far more than 4000 papers, proves to deliver this. Its name is the theory of planned behavior (TPB). The predecessor of this theory was the theory of reasoned action which Ajzen and Fishbein introduced in 1975 and 1980. The old theory was already helpful for predicting behavior but missed an essential variable. They did analyze that behavior was not free of will and in control most of the time. Therefore, the researcher Icek Ajzen added this construct by adding perceived behavioral control as another variable. With this addition, the theory of planned behavior was born. For a more straightforward interpretation, the theory gets visualized below.

The theory states that three beliefs influence human behavior: behavioral, normative, and control beliefs. The behavioral belief deals with the consequences of the behavior; normative beliefs are about the normative expectations of others, and control beliefs oversee the existence of obstacles that may influence the behavior and thereby either facilitate or impede it. Each

of these variables influences another. Behavioral beliefs affect attitude toward behavior which can be negative or positive. Normative beliefs result in the perceived social pressure or subjective norm and control beliefs in behavioral control or self-efficacy. The construct also explains the relationship between these variables. As a result, the stronger a person's intention to undertake an action is, the more positive their attitude and subjective norm are, and the higher the perceived control. Chen, (2007) took these constructs and made an assumption about organic food purchase behavior: He assumed that the attitude to purchase organic food is positively related to the attitude toward organic food. This positive relationship means that if the attitude toward organic food is positive, the consumers' attitude toward purchasing organic food will also be positive. Therefore, the consumers' likelihood of purchasing organic food will be higher. The construct also illustrates that if people have actual control over their behavior, they are more likely to perform their intention in the right situation. (Ajzen, 2019a)

In addition to the TPB, Solomon et al., (2014), cited in Li et al., (2021), went a different path and examined the decision-making stages. He identified four processes to elaborate on this theory. These are complex, habitual, cognitive, and emotional decision-making processes that concern high and low involvement. The complex decision process tackles four aspects: deciding where the problem is first recognized, the information collected, and the evaluated product. Eventually, deciding to purchase the product. Habitual decision-making is the same but easier and does not include gathering information and evaluating the product to make the purchase decision. Next, cognitive decision-making results in purchasing intentions (Quester et al., 2007, cited in Li et al., 2021). The final stage is emotional decision making, whereas the name implies that the attention shifts to the individual's feelings, which results in making the purchase decision (Rezvani et al., 2015, cited in Li et al., 2021). To further understand these stages, high and low involvement for a product changes the decision. For products that apply high involvement, the individual passes all stages. This stage is often the case for costly products like

buying a new car. For products with low involvement, the individual buys the product regularly without thinking about it much, and where consumers do not often seek additional information about the good or seek alternatives. One example for this category could be regularly bought low-cost food. At first glance, organic food may also be categorized as a low involvement product, as it is not as expensive as buying a new car and regularly bought by some consumers. However, in contrast to low-cost food, organic food is much more expensive and many consumers seek additional information about organic products resulting in their attitude towards them changing. Therefore, normal food can be described as a low involvement product, but not organic food. As for the decision-making stages, organic products can get placed into the complex decision-making stage. Many consumers first see the problem, either the environment or health, then collect information about the product, such as looking at the organic food label and the ingredients contained in the product and finally deciding whether they like it. Eventually, the product can get placed into the habitual decision-making when purchasing the organic product becomes a habit, and no additional information is sought.

After understanding organic food and its buying and decision-making behavior, comprehending the basics of health and environmental attitudes is vital for this research. The following paragraphs will try to clarify this lack of knowledge.

2.3 Attitude

The basic building block for the two independent variables is attitude. It is beneficial to know what attitude is when understanding consumer behavior. Singhal, (2017) connected attitude with an emotional proclivity, indicating some fondness and disdain towards a specific object. When connecting attitude with organic food, Kusumaningsih et al., (2019) discovered that a positive attitude towards organic food would motivate consumers to consume organic food. There are, however, different kinds of attitudes toward organic food, such as health attitudes, which will be analyzed in the following section.

2.4 Health attitudes and health consciousness

As previously teased and further supported by Mehmet et al., (2014), many consumers favor organic products due to their perceived health and nutrition benefits. Consumers who care about their health often tend to purchase organic food instead. It is therefore interesting to see how the health consciousness affects the purchase behavior of organic food. According to Kusumaningsih et al., (2019), health consciousness is a person's tendency to focus on health.

Even though some evidence does not support the healthier benefits of organic food, several consumers believe in them (Massey et al., 2018).

These beliefs indicate a connection between health and the consumption of organic food. Additionally, consumers who want to live a healthy lifestyle tend to consume food products that are more healthy (Basha et al., 2015).

Finding out an individual's attitude towards health and how to measure this attitude towards health is an essential step for better understanding consumers' purchase behavior. Mohamed et al., (2012), cited in Basha et al., (2015), found out that there is an influence on the consumer attitude of an individual towards organic food when wanting to be healthier and the willingness to pay a premium for organic food products. He also found out that the biggest motivator for purchasing organic food was wanting to live a health-conscious lifestyle. Therefore, health consciousness has an impact on purchasing organic food. Regardless, there are specific implications for health consciousness and health attitudes to keep in mind.

Although health consciousness and health attitudes are closely linked, they are perceived differently worldwide.

Nagaraj, (2021) saw the distinction in demographic and lifestyle aspects of the individual. These aspects talk about where the individual lives, what type of resources the individual has, and how he treats his health. Someone from East Asia would treat his health and what he eats differently from someone living in Europe. Considering these differences in attitude is essential when conducting the analysis.

As for Germany, research done for the Öko-Barometer (2021), which analyzes the shopping habits of German consumers, showed that eating healthy foods was the most important or second most important reason for half of the recipients to purchase organic food. Adding to that, many said that prohibiting synthetic fertilizers was also a key component in the decision-making. To further support this claim, Kusumaningsih et al., (2019) also said that health consciousness positively influences the attitude towards purchasing organic food. In addition, he further stated that there is an influence on their attitude of purchase behavior if an individual is aware of their health.

These statements correlate with a study done by Van Loo et al., (2013), who analyzed the buying behavior between organic and conventional yogurts. The results showed that consumers who buy organic food and organic yogurts think it is healthier than conventional yogurt. In addition, they said that the most significant difference between the two yogurts is that organic yogurt is more healthy than conventional yogurt. More environmentally friendly, safe, trustworthy, and higher quality were also mentioned.

Out of these findings, the following hypotheses can be assumed:

Assumption 1: A positive health attitude and health consciousness positively influence purchasing behavior towards organic food.

Regardless, health attitudes and health consciousness are not the only variables influencing the purchasing behavior of organic food.

2.5 Environmental attitude

According to the American Psychology Association (2022), Environmental attitude is defined "as beliefs and values of individuals or societies concerning nature, ecology, or environmental issues." As measured by Kusmaningsih et al., (2019), environmental attitudes, besides health consciousness, also strongly influence the purchase behavior of organic food.

With consumers shifting the global agriculture market towards other environmentally friendly practices with other environmental attitudes (Giampieri et al., 2022), environmentally friendly practices are shifting the attention to organic farming, defined by Forman et al., (2012, p. 1407) as an approach where crop growth and livestock raising are conducted without using "synthetic chemicals, hormones, antibiotics agents, genetic engineering and irradiation." He goes further on to explain that the certification for organic can only be gained if the harvest has not been modified with synthetic fertilizers at least three years before the harvest. Today, organic farming receives a strong backwind from government entities and researchers and has a well-established reputation in society. According to Giampieri et al., (2022), it is one of the fastest expanding sectors in agriculture.

Due to these reasons, many believe that organically produced food is more sympathetic to the environment and better for health. This statement is also aligned with other research conducted.

On the contrary, Clark & Tilman, (2017) analyzed the environmental aspect of organic production. It concluded that organic systems require between one quarter and a little over double the amount of land, under a fifth less energy and have a similar account of greenhouse gas emissions compared to other conventional systems. It must however be noted that these values do not apply to every food category and Massey et al., (2018) further stated that consumers nonetheless have faith in the benefits of organic food.

Adding to that, environmental concerns continue to rise and affect consumer buying behavior. These concerns started appearing between the 1960s and 1970s due to an oil leak that led to an environmental disaster appearing on the

news (Grunert & J. Juhl, 1995). These events kicked off consumer attitudes to change based on environmental concerns. To strengthen this statement, Liu et al., (2021) stated that the higher the number of people who encounter environmental issues, the more their attitude towards their actions changes. This attitudinal change also has a direct impact on their food purchase behavior. Also, people who watch scandals on tv tend to avoid traditional food and are more likely to have a positive attitude toward organic food (Hjelmar, 2011 cited in Liu et al., 2021).

Studies showed that consumers' environmental awareness influences their organic food purchasing behavior. Dhir et al., (2021) mentioned that people concerned about the environment are more likely to purchase environmentally friendly products. Environmental attitudes connect to the consumer's environmental consciousness and attitude, as Heru, (2015) reported an effect between those two variables to influence the buying behavior of organic food positively. Moreover, where organic food is perceived to be healthier for humans (Mehmet et al., 2014), its effect on the environment is also perceived to be more environmentally friendly (Heru, 2015) than conventional food for the most part. Heru, (2015) further supported this as he explains how to minimize environmental impacts by using Manure and organic compost to grow crops. Ghufran et al., (2022) also stated that using environmental protective methods and keeping biodiversity intact is defined as organic food. Kusumaningsih et al., (2019) even argue that environmental attitudes have a more substantial impact on purchase behavior than health attitudes.

Moreover, researchers have identified demographic variables that affect environmental attitudes. The first to be discussed is knowledge. A general rule for knowledge is that environmental knowledge has the potential to support positive environmental attitudes and behavior (Bogner, 1998). Other research has found that many demographic variables link to environmentalism. Taking gender into account, Kuklinski et al., (1982) cited in McMilan et al., (1997), saw an essential difference in environmental attitudes contingent on the knowledge that men and women have. He saw a difference in the level of concern towards the environment dependent on that knowledge. The more

knowledge an individual has about the environment and environmental issues; the less this individual will be concerned about these risks. Men seem to have more knowledge about the environment and are less likely to be concerned.

Arcury et al., (1986); Nelkin, (1981); and Stem et al., (1985), cited in McMilan et al., (1997), tried to explain this behavior and concluded that women are also closer to nature as they often take the roles of nurturers and caretakers and are therefore more concerned about the environment and issues connected with it.

To continue, several studies examined the environmental friendliness of organic food. The following section will explore the results obtained utilizing the environmental footprint of organic and conventional food products.

2.5.1 Environmental footprint organic vs. conventional

The environmental footprint between organic and conventional food varies, especially between the individual food categories. A study conducted by Pieper et al., (2020) analyzed different food categories such as dairy, fruit and vegetables, and cereal. A higher CO₂eq/kg for conventional type foods was noted for these categories. It further must be said that conventional type foods are divided into only conventional and with land-use-change (LUC). This category is included because conventional methods may convert land through deforestation and other practices to increase production, which increases carbon emissions.

On the other hand, organic methods must use the already given land and may not create more. The data with LUC noted a significant increase in the emissions for conventional foods. It was noted that the production method for conventional ruminants had a very similar emission output as organic food with the LUC included. On the other hand, a significant decrease in emissions from conventional to organic food production methods of up to half the emissions could be observed for other food categories such as dairy, fruit and vegetables, and cereals. This research supports the statement that buyers generally consider organic food more environmentally friendly.

However, research shows the opposite for organic meat. Buratti et al., (2017) analyzed the carbon footprint of two farms that produce organic and conventional food with subsystem contributors. The research details beef production, energy consumption, and manure management. The results were given in $\text{Co}_2\text{eq/kg}$ of live weight and showed a considerably higher footprint for organic compared to conventional food. Especially for beef production, the cow-calf stage and the more extended finishing period, which is reportedly twenty months for conventional and twenty-four months for organic food, showed to be the reason for the higher carbon footprint. These stages result in a higher methane output by the cow, which increases the carbon footprint. In addition, it was reported that the output is also dependent on the type of diet the livestock receives. The data retraced this phenomenon to grass-fed and roughage fed, which influences the digestion process of the cow and results in higher methane emissions. The diet-based emissions thereby also influence the manure management of the cows, resulting in more than double the methane emissions from conventional to organic food. Finally, the energy consumption between the two techniques is the same. When comparing the total carbon footprint between the two management techniques, organic food produces higher $\text{Co}_2\text{eq/kg}$ of live weight with "24.62 $\text{Co}_2\text{eq/kg}$ of live weight" compared to conventional, which produces "18.21 $\text{Co}_2\text{eq/kg}$ of live weight" (Buratti et al., 2017, p.135).

The study conducted by Pieper et al., (2020) came to a similar conclusion, that the production method for organic ruminants has a significantly higher emission output than conventional.

These findings lead to the conclusion, that organically produced food is in fact more environmentally friendly from a carbon emission point of view.

Especially dairy, fruit and vegetables and cereals show a considerable decrease in carbon emissions.

However, this is not the case for animal products such as livestock, as they show an increase. The research therefore suggest that consumers should buy more organic products from an environmental footprint point of view, with the exception for meat, which should be bought more conventional as it shows

better values. Considering these results when making this claim is therefore vital.

Assumption 2: There is a positive relationship between environmental attitude and the purchasing behavior towards organic food.

The last section will deal with food labels and how they shape consumer attitudes and buying behavior toward organic products and, ultimately, how people see them.

2.6 Food Labels

Food labeling is essential in consumer decision-making as it shows whether a product is certified organic. Bandara et al., (2016) discovered that labels with nutritional information and health claim strongly affect purchase intention. Labels on products are essential as consumers know the ingredients that went into making the product, from the production under safe circumstances to providing more information about the product and disclosing how qualitatively high the product is. Through labels, people can distinguish between organic and non-organic food, influencing their attitude toward the product and, ultimately, their decision-making (Bandara et al., 2016). However, the attitude towards the organically certified product has specific requirements that affect the consumers' attitude towards the product. One requirement is that the consumer is familiar with the logo and knows its meaning (Janssen & Hamm, 2012). Several studies showed that there is still a gap in knowledge about organically certified logos (Janssen & Hamm, 2012).

On the other hand, Germany is quite familiar with the organic certificate logo. The Öko-Barometer (2021) supports this knowledge base where at least eighty percent of the surveyed were knowledgeable about the logo's look. For logo awareness, education also plays an essential part as people with a higher level of education seem to know more about organic food labels. The percentage further increases when it comes to people who nourish themselves vegan or with meat and lots of fruit and vegetables.

To conclude, affective and cognitive components affect the attitude towards the logo (Janssen & Hamm, 2012). Affective is the trust and credibility placed in the logo and cognitive, which comprises the logos recognition and the acumen of safety and control measurements placed within the production process. It is also worth mentioning that these two components depend on each other.

Another notion worth mentioning is the effect of design on an organically certified logo. Because organic product logos often include the color green, they are associated with a healthy alternative to conventional food. Richetin et al., (2022) studied this phenomenon and summarized that green organic logos shape the opinion on healthy foods as they often bring green organic logos in connection with healthy products.

There are, however, different types of certified organic logos. Forman et al., (2012, p. 1407) summarized them into three categories. These categories apply in the United States and are different from the requirements in Europe. The first category is when a product is one hundred percent organic and only contains organic processing methods and ingredients. These products are labeled "100% organic". Products with the phrase "organic" must only contain at least ninety-five percent organic food. The rest can be conventionally-grown, but the used fertilizer mediums must be on the approved USDA list. The last stage is the label "made with organic ingredients." This organic food requires seventy percent organically processed food. The rest may be conventional, as in the label mentioned above.

To conclude, organic labeling of products influences the attitude of consumers' buying behavior. The requirements for this to stay true are that the person is knowledgeable about the logo and trusts it. If that is the case, according to Mehmet et al., (2014) opinion, the consumer's attitudes are mostly positive about the good.

3. Methodology

This research aims to determine the effects of health and environmental attitudes influence on the purchase behavior of organic food. This question is exciting as organic food has gained incredible momentum in developed economies in past years (Chen, 2007). The reasons for choosing organic food products over conventional food products vary. Some people buy organic food because of its higher quality than conventional food (Massey et al., 2018), some say organic food just tastes better, and others are concerned about food safety and animal welfare. The most mentioned motives to buy organic food were subgroups of two terms. First, many consumers mentioned the importance of the environment when choosing organic food products. Second, organic food being more healthy has also become part of this decision process. (Öko-Barometer, 2021) Therefore, this research tackles this field and analyzes the connection between health, environment, and organic food purchase behavior. For creating excellent and scalable research, the terms health and environment need to be measurable. These terms will thus be identified with people's attitudes as this allows seeing how people think and feel about their health and the environment. In addition, previous researchers have already established validated scales for both health and environmental attitudes that allow for precise results.

These scales will be thoroughly identified in the following sections.

The research question has two independent and one dependent variable. The two independent variables are health attitudes and environmental attitudes. These will be tested for and associated with the dependent variable, which is the purchase behavior of organic food in this case.

To follow up, the approach used in this research is mainly quantitative. A qualitative approach will also surface in open-ended questions, so one could argue that there is also a mixed-method approach, but the main direction is a quantitative approach. This approach is helpful as the research wants to analyze people's buying behavior targeting a larger audience. In other words, the average consumer of organic and conventional food products. Another reason to choose this approach is that quantitative gives a better understanding

and knowledge of the larger population. With this approach, the data shows relationships, patterns, and averages, thereby making predictions for the future.

The research design points towards an explanatory design because the cause-and-effect relationship between the two independent and dependent variables are measured. The research tries to explain this relationship between the organic food purchase behavior, environmental attitude, and health consciousness through a survey.

3.1 Survey development

As already indicated, this research used a survey to collect the necessary data. An excellent tool to create surveys in this format is google forms, which is why this survey used this tool.

The survey had quantitative and qualitative questions, divided into several question blocks. First, the respondent was given an abstract with general information about the survey. This abstract also pointed out the necessary time to complete the survey, the anonymity of the data collected, and the accordance with the current data protection regulations. Then, the participant was asked for consent to participate in the survey. If this was accepted, the participant was forwarded on to the following questions. When the consent was not given, the survey ended.

3.1.1 Demographics

The first question block of the survey consisted of asking general demographic questions. These questions included gender, age, and the highest degree of school completed. Gender questions came in a multiple-choice grid, where the respondent could choose between males, females, and others. Age further appeared in the form of a multiple-choice grid. The participant could choose the following options: "12-17 years old, 18-24 years old, 25-34 years old, 35-44 years old, 45-54 years old, 55-64 years old, or 65 years or older". The highest degree the participant has obtained, or level of school completed also appeared in a multiple-choice grid. The degree was measured between some schools, but no diploma; high school graduate; diploma or the equivalent;

some college degree or no degree; bachelor's degree; master's and professional degree.

3.1.2 Purchase behavior towards organic food

After the respondent completed these demographic questions, the next question block appeared, asking about the purchase behavior towards organic food. The behavior measured between the four main categories of food: meat, dairy, fruit and vegetables, and grain. For this purpose, the respondent received questions about the quantity of consumption of these food categories in a week. These questions appeared in a drop-down menu on a scale of 0 to 7 for all days in a week, with 0 being no breakfasts, lunches, and dinners and seven being seven for all breakfasts, lunches, and dinners. Afterward, the respondent was asked for each food category individually and what percentage of the meat, dairy, fruit and vegetables, and grain they buy is certified organic. These questions also appeared as a drop-down menu from 0 to 100% in steps of 10 (0%, 10%, 20%...) The last two questions of this block were open-ended qualitative questions, which were optional to answer. The first question asked for the reason for buying organic food, and the second for what stops them from buying more organic food.

3.1.3 Health attitudes and consciousness

The third question block was about the participant's health attitudes and consciousness. Measuring the respondent's level of agreement occurred on a scale of 1 to 7, where one was Strongly Disagree, and seven Strongly Agree, with four being neutral. This block was a subset of 10 general questions about health that try to measure health attitudes/ health consciousness. A previous survey done by Hyehyun Hong (Hong, 2020) provided these questions and allowed the development of a scale to measure health consciousness. He divided health consciousness into five parts. First, the engagement in health consciousness, then the psychological attention to one's health, the health information seeking and usage, the personal responsibility, and health motivation. The scale he developed includes all five dimensions in 10 questions.

3.1.4 Environmental attitudes

The final block was about the environmental attitudes of the respondent. These questions asked for the respondent's level of agreement and appeared on a scale between 1 and 7, where one was Strongly Disagree, 7 Strongly Agree, and four neutral. The measurement taken for this section was the New Ecological Paradigm Scale (NEP). This scale has a long history, dating back to 1960 when it was called the New Environmental Paradigm (Anderson, 2014). This paradigm was the original NEP, inspired by the dominant social paradigm (DSP), which measured people's ideology. Due to changing worldviews and growing environmental concerns, the original New Environmental Paradigm was developed, which included the DSP and the growing environmental ideology in 12 key points. Due to the lack of consistent answers and poor correlation between the statements, the development of the New Ecological Paradigm occurred, which is the currently used and revised tool to measure environmental awareness. This revised tool has seven statements that reflect the DSP and eight statements for the approval of the new paradigm to a total of 15 statements. With time, many researchers validated and used this scale, known as an accurate measurement of environmental attitude. (Anderson, 2014) For this research, this scale helped to analyze and compare the environmental attitudes to the health attitudes of the respondents.

3.1.5 End of survey

After the respondent answered these questions, the survey was over. The respondent received a "Thank you for participating" note and was given the option to enter a lottery giveaway for a 25€ Netflix coupon. This method boosted additional responses to the survey. The survey was available to answer for one month or until the necessary number of participants was reached. To get valid and accurate results, the goal of the survey was at least 90 participants.

Furthermore, the survey was shared on the social media websites Instagram and WhatsApp. In addition, the survey used a snowballing effect because it

asked the respondents to share the survey on their social media accounts. The snowball effect gave a large enough spread which led to a total of 98 participants in the end.

3.1.6 Constructs Items Table

All questions used for the survey, except for measuring purchase behavior of organic food, were found, or directly extracted or adapted from existing sources.

Table 1: Constructs Items Table

Variables and Constructs	Questions	Source
Purchase behavior of organic food	<ul style="list-style-type: none"> - Each week, how many of your breakfast contain meat/ dairy/ fruit and vegetables/ grain? - Each week, how many of your lunches contain meat/ dairy/ fruit and vegetables/ grain? - Each week, how many dinner contain meat/ dairy/ fruit and vegetables/ grain? - What percentage of the meat/ dairy/ fruit and vegetables/ grain you buy is certified as organic? 	
Health attitudes/ health consciousness Questions 1, 2, 3, 4: Self-health awareness Questions 5, 6, 7: Personal responsibility Questions 8, 9, 10: Health motivation	<ol style="list-style-type: none"> 1. I'm very self-conscious about my health. 2. I'm generally attentive to my inner feelings about my health 3. I reflect about my health a lot 4. I'm concerned about my health all the time. 5. I notice how I feel physically as I go through the day 6. I take responsibility for the state of my health. 7. Good health takes active participation in my heart 8. Living life without diseases and illness is very important to me 9. My health depends on how well I take care of myself 10. Living life in the best possible health is very important to me. 	Hong, H. (2020, November 4). <i>Scale development for Measuring Health Consciousness: Re-conceptualization</i> . Institute for Public Relations. Retrieved May 26, 2022, from https://instituteforpr.org/health-consciousness/
New Ecological Paradigm (NEP) Questions 1, 2, 3: Limits of growth Questions 4, 5, 6: Anti-Anthropocentrism Questions 7, 8, 9: Fragility Nature Balance Questions 10, 11, 12: Rejection exceptionalism Questions 13, 14, 15: Possibility eco-crisis	<ol style="list-style-type: none"> 1. We are approaching the limit of the number of people the Earth can support. 2. Humans have the right to modify the natural environment to suit their needs. 3. When humans interfere with nature it often produces disastrous consequences. 4. Human ingenuity will insure that we do not make the Earth unlivable. 5. Humans are seriously abusing the environment. 6. The Earth has plenty of natural resources if we just learn how to develop them. 7. Plants and animals have as much right as humans to exist. 8. The balance of nature is strong enough to cope with the impacts of modern industrial nations. 9. Despite our special abilities, humans are still subject to the laws of nature. 10. The so-called "ecological crisis" facing humankind has been greatly exaggerated. 11. The Earth is like a spaceship with very limited room and resources. 12. Humans were meant to rule over the rest of nature. 13. The balance of nature is very delicate and easily upset. 14. Humans will eventually learn enough about how nature works to be able to control it. 15. If things continue on their present course, we will soon experience a major ecological catastrophe. 	<ul style="list-style-type: none"> • Anderson, M. (2014). New Ecological Paradigm (NEP) Scale. THE BERKSHIRE ENCYCLOPEDIA OF SUSTAINABILITY: MEASUREMENTS, INDICATORS, AND RESEARCH METHODS FOR SUSTAINABILITY, 260–262.

3.2 Data collection

The researcher used convenience and snowball sampling to reach out to participants to complete the survey. Convenience sampling is a method adopted by researchers where they collect market research data from a conveniently available pool of respondents." (ProQ. 2018). When using convenience snowball sampling, the data becomes less representative of the general population though. This needs to be considered when conducting the data analysis. Adding that a snowball sampling method is "where research participants recruit other participants for a test or study." (Glen. S, 2018) Therefore the researcher will approach the participants through social media networks to gain participants. The survey will be posted on Instagram for participants to click a link that leads them to the survey and share on WhatsApp through a link to share with others. In light of the current pandemic, where the Covid-19 virus makes physical contact with others more difficult than usual, this method effectively collects data. It also allows to reach out to participants that would not have been possible beforehand. The data collection occurred from March 14th, 2022, until May 7th, 2022. The goal of the survey was to have around 100 participants to generate an accurate and valid result that the researcher can analyze. In the end, 98 responses could be obtained.

3.3 Data analysis

After the sample of $n=98$ is collected, the data can be downloaded and put into a data analysis program. The program used for the data analysis is called Jamovi. The data analysis process will look like the following. First, the data will be cleaned by determining the level of measurement and replacing the values with numbers. Afterward, the dataset will be analyzed by first looking at the descriptive statistics, determining the normality, and finally testing the hypotheses.

It is vital to note that this dataset has two different levels of measurement. The answers for the purchase behavior of organic food range from 0 to 7, with zero

being no meals consumed of the type of food. Because there is an actual zero point, this level of measurement is called a ratio. Other questions about health and environmental attitude have no natural zero point and are an interval level of measurement. The level of measurement is essential to know as it can falsify the dataset. The Jamovi software has a drop-down menu to choose the correct measurement. The data cleaning process will look like the following.: First, the number of participants will be recounted by creating another tab and giving each participant a number.

Then, each question block will be recoded to a number to make them measurable. Because the first questions about organic food purchase behavior already consist of numbers as answers, they can stay the same. These numbers go from 0 to 7.

However, the questions about health attitudes and health consciousness are different. As they come in the form of a Likert Scale, a number will replace them. Strongly Disagree will be replaced with a 1, Somewhat Disagree with a 2, Disagree with a 3, Neutral a 4, Agree a 5, Somewhat Agree a 6, and Strongly Agree a 7. The final questions about environmental attitudes will follow the same principle.

Next, checking the data for fraud is vital. Fraud is recognizable when a participant has fast response times. Next, missing variables must be detected. They will be ignored and characterized as "Neutral" if they are detected, and in the case of too many skipped questions, the respondent will be deleted from the dataset. For the numbers in the dataset, the average will be calculated by the mean. That mean will then represent the missing variables.

Subsequently, the data cleaning process will be completed, and the descriptive statistics can be analyzed. Descriptive statistics will help interpret the data better and are vital to analyzing. Descriptive statistics involve showing the central tendency, dispersion, and normality. Therefore, the mean, standard deviation, and Pearson correlation test will be conducted. Determining the normality will happen through a visual examination of a histogram.

Determining the normality will then also help later in the data analysis when describing the central tendency.

To describe the data, a visual representation of the dependent variables will be provided through a boxplot. This visual representation will help provide which food category is consumed the most.

Accompanied by the boxplot, the median, standard deviation, and variance will also be stated. Through these measurements, the variability of the data will be determined, which is essential for the research. The median is also taken as a measurement for central tendency, as it takes outliers in the dataset into account.

A Pearson's correlation test will also be conducted to test the hypotheses. First, this test will be performed for the scales measuring health and environmental attitudes. If these tests fail, the individual constructs of those scales will be examined.

For understanding, H_0 means that there is no relationship between the dependent and independent variables, which will be tested with the help of the correlation tests and the level of significance. A p-value of 0.5 indicates the level of significance and the risk of a type 1 error or false positive. Therefore, if the p-value is smaller than 0.5, we reject the null hypotheses and accept the alternative hypotheses. In order to gain further information about the relationship of the variables, a regression analysis will also take place. This analysis will give an equation for a graph that allows us to predict how the two variables will depend on each other in the future. The regression analysis will help to identify the independent variables that have an impact on the dependent variables. This dependency will be reported by the standard estimate.

Thereby, a negative variable can have several meanings and is dependent on the assumption for that variable. It is also dependent on whether the variables were reverse coded. The reverse coded questions from the NEP scale are question 2, 4, 6, 8, 10, 12 and 14. As for the health consciousness scale, question number 1 were reverse coded. After these tests are conducted, the data analysis is over, and the results obtained can be discussed.

4. Survey analysis

The following section of this report will devote to the survey findings and analyze the assumptions made for this report. The first section will dive into the descriptive analysis of the sample, followed by a deeper analysis of the relationship between the dependent and independent variables through a linear regression analysis.

As previously discussed in the methodology, the survey used convenience sampling with a snowballing effect and was therefore shared through on social media channels such as Instagram. The survey reported a high rate of completion. For the participants who left out answers, the mean of the answers for that column was replaced.

4.1 Sample

Table 2: Gender

Gender	N	%
Male	32	32,7%
Female	63	64,3%
Other	2	2%
Prefer not to say	1	1%
Total	98	100%

As for the sample, a total of 98 individuals took part in the survey of which 63 (64,3%) chose “Female”, 32 (32,7%) chose “Male”, 2 (2%) chose “Other” and 1 (1%) “Prefer not to say”. This indicates an overrepresentation of females in the sample population. As previously indicated in the data collection, through the snowball sampling technique, the population of this sample does not represent the population of Austria. The survey further reported a large sample from people born between 18 and 24 years old, as well as a moderately significant sample from people born between 25 and 34 years old. This is understandable on the one hand, because social media is greatly used by a young

audience, but on the other hand not representative, as young female respondents are unlikely to have the characteristics of the Austrian population.

4.2 Descriptive

The following paragraphs will discuss the descriptive of the five dependent variables in this research. Thereby the variables were measured for their central tendency and variability. They were first tested for their normality, which was done through a visual examination of the histograms of each dependent variable. It was concluded that all dependent variables are not normally distributed. In addition, the proportion of meals was calculated. To further examine each dependent variable, a boxplot was created. The boxplot was chosen as it is a good illustration of the distribution of the data. Because the data is not normally distributed and therefore includes many outliers, the median provided in the boxplot graph gives a better examination than the mean, which does not take those outliers into account.

4.2.1 Proportion of meals

The proportion of meals was calculated by first adding up the sums of each food categories and second taking the sum of each individual food categories and dividing them by the sum of all food categories. This then provided the proportion of meals contained in the diet of the sample. From the data obtained, the highest proportion of meals is fruit and vegetables with a mean score of **0.400**. This score is followed by grain with **0.237**, then dairy with **0.208** and finally meat with a score of **0.155**. This ranking gives valuable insight when taking it into relation with the percentage of organic food the participants buy. The organic percentage of each food category is therefore described below.

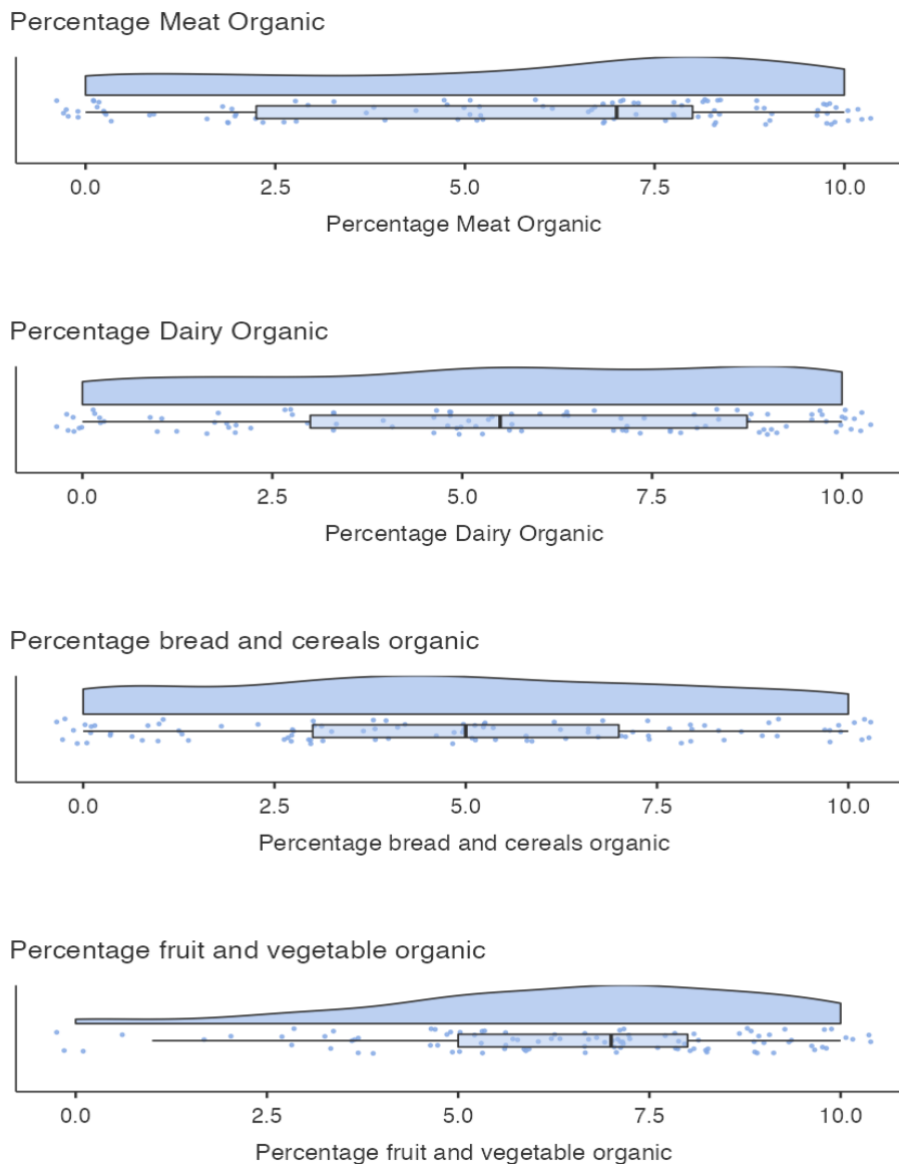


Figure 1: Percentages of food categories certified organic

4.2.2 Percentage Meat Organic

The first boxplot shows the percentage of meat products the participants buy certified organic. As illustrated by the boxplot, the median for the percentage of meat certified organic is **7.00** with an IQR of **5.75**. It furthermore has a mean of **5.61** and a standard deviation of **3.41**. The mean shows that the participants buy on average **56.1%** of their meat organic. These results show that the sample is not representative to the Austrian population, which is roughly eleven percent organic (Organic Food was Trending in Austria in 2021, 2022).

4.2.3 Percentage dairy organic

The second boxplot shows the percentage of dairy products the participants buy certified organic. Here, the boxplot indicates a lower median of **5.50** with the same IQR of **5.75** as for meat products certified organic. Adding to that, the mean of this boxplot is **5.46**, which means that **54.6%** of the milk is consumed organic. The standard deviation is **3.36**. As discussed for the previous boxplot, the consumption of dairy organic is also not representative for the population of Austria, which is reported to consume roughly 11 percent organic (Organic Food was Trending in Austria in 2021, 2022).

4.2.4 Percentage bread and cereal organic

The third boxplot shows the percentage of bread and cereal products the participants buy organic. The boxplot shows a similar median of **5.00**, compared to dairy products certified organic with an IQR of **4.00**. The mean on the other hand is **4.82**, which means that **48.2%** of the bread and cereal is consumed organic and the standard deviation is **3.16**. This boxplot also shows relatively high values to have it compared to the Austrian population, which consumes roughly eleven percent organic (Organic Food was Trending in Austria in 2021, 2022). It can therefore be said, that the data obtained is also not representative.

4.2.5 Percentage fruit and vegetables organic

The last boxplot shows the percentage of fruit and vegetable products the participants buy certified organic. The median for this variable lies at **7.00** and has thereby similarities with organic meat bought. The IQR is at **3.0**, which is the lowest out of all the other food categories. The mean on the other hand is **6.53**, which shows that **65.3%** of the fruit and vegetables are consumed organic. The standard deviation is **2.44**. This data also shows low chance of being representative due to the reasons discussed for the other variables above.

4.2.6 Discussion of descriptive

The Std. deviation gives insight into the variability of the data collected. The standard deviation is equal to or greater than **2.44** for all variables. The mean also gives an average of the respondent's answers, which ranges between **4.82** and **6.53** dependent on the respective food category. This means that the respondents consume between **48.2%** and **65.3%** of their food organic, which is not in correlation with the Austrian average. These numbers are in fact four to six times higher than that of the Austrian average. Alternatively, when taking the median of the data obtained, it ranges between **50%** and **70%**. This statistical measurement illustrates an even higher rate of up to seven times the consumption of the average Austrian. It indicates several doubts about the reliability of the data obtained. And although the data shows that the respondents consume a relatively high amount of organic food products, it is difficult to trust those results.

The boxplot also shows which food category has the highest organic share in the diet of the participants. Based off the median, organic meat as well as fruit and vegetables are the most commonly products bought organic, followed by organic dairy and organic bread and cereal. Taking this insight into account and comparing it to the proportion of each category in the participants meals gives a better understanding of the participants buying behavior. It shows that the participants not only consume a lot of fruit and vegetables, but also buy a lot of those fruit and vegetables organic. Another insight gained is the smaller proportion of meat contained in the participants diet, but therefore a higher percentage of that meat being organic. As for dairy and grain products, they were the second and third most common proportion in the participants diet, but the least bought organic. It is however difficult to extrapolate these findings to the buying behavior of Austrians, as their diet contains a much lower percentage share of organic food.

4.3 Correlation Analysis

To further analyze the data collected and see the correlation between the variables, a correlation matrix was conducted between the five dependent variables, the two independent and their individual constructs.

Table 3: Pearson’s correlation coefficient between percentage organic food and scales

Variable	Pearson’s r	p-value
NEP-Composite	-0.010	0.920
Health-Composite	-0.022	0.829

Table 3 shows the correlation between the aggregate for the percentages of organic food and the aggregate for health attitudes and the NEP scale. A Pearson’s correlation was conducted as the linear trend between the variables is measured. For guidance, a Pearson’s r of zero indicates no linear association between the variables, a Pearson’s r between +1 and 0 indicates a positive linear relationship and between -1 and 0 a negative relationship. It further measures the strength of the correlation. Because both variables have a close to zero relationship, it is said that they have a very weak linear relationship. The p-value indicates a similar finding. It measures the significance of the findings from the sample. The cut-off point is regularly set to 0.05 (95%). The results for both scales indicate a non-significant result. Because of these circumstances, the individual constructs of the two independent variables need to be analyzed to establish the linear relationship.

Table 4: Pearson's correlation coefficient between aggregate percentage organic food and constructs

Variable	Pearson's r	p-value
Limits of growth	0.164	0.106
Anti-Anthropocentrism	-0.049	0.629
Fragility Nature Balance	-0.151	0.137
Rejection exceptionalism	0.070	0.496
Possibility eco-crisis	-0.091	0.374
Self-health awareness	-0.029	0.780
Personal responsibility	0.004	0.966
Health motivation	-0.037	0.716

Table 4 shows the individual constructs of the health and NEP scale. As in the previous table, they were also tested with the Pearson correlation testing. The results show stronger positive relationship for Limits of growth and negative relationship for Fragility Nature Balance. These variables are also the two closest to being significant out of the dataset.

4.4 Linear Regression

A linear regression analysis was conducted to analyze the relationship between the variables further. Because the composite for the health and NEP scale did not show a good prediction for the independent variables (IV), they are not included in the analysis. As an alternative, the individual constructs of those scales were analyzed.

4.4.1 Regression Model 1

Linear Regression

Model Fit Measures

Model	R	R ²
1	0.393	0.155

Model Coefficients - Percentage food

Predictor	Estimate	SE	t	p	Stand. Estimate
Intercept	7.519	1.528	4.92	<.001	
Limits of growth	0.657	0.260	2.53	0.013	0.281
Possibility eco-crisis	-0.604	0.285	-2.12	0.037	-0.235
Gender Comp.	-1.227	0.398	-3.08	0.003	-0.293

Assumption Checks

Collinearity Statistics

	VIF	Tolerance
Limits of growth	1.37	0.731
Possibility eco-crisis	1.37	0.731
Gender Comp.	1.00	0.999

Figure 2: Linear Regression model - percentage organic food

Figure 2 is the first model and shows the linear regression between the composite of the percentage for organic food and two independent variables. Through the R² value, we can determine how well the model predicts the

dependent variables. These are "Limits of growth," "Possibility eco-crisis," and "Gender" in this model. "Gender" was included as a demographic variable, as it counted as a better prediction for the model. Based on the R² value, this model explains 15.5 % of the variance in organic food purchasing. The estimate is the coefficient in this model. With the estimate coefficient an equation for the percentage of organic food can be formed. This equation allows us to predict dependent variables by using the variables of the independent variables. For this model, the equation is the following: $7.519 + (0.657 * \text{Limits of growth}) - (0.604 * \text{Possibility eco-crisis}) - (1.227 * \text{Gender}) = \text{Percentage Organic Food}$. As seen in the equation, the coefficient is either positively or negatively shown in combination with the independent variables. If the coefficient is positive, the independent variable agrees with the expectations. The contrary applies to a negative estimate coefficient. It must be noted that these signs also depend on how the variables were coded and whether the assumption estimated a negative or positive variable. As for the estimate, it has a small error. The variables might be given in different measurement levels. Due to this possible conversion in the variables, we need to look at the Std. Estimate.

The Std. Estimate also provides insight into the agreement of the variables towards the research expectations. "Limits of growth" have a positive score and therefore agree with our expectations. The higher the score for the percentage of organic food, the higher the score for limits of growth. On the other hand, the "possibility of eco-crisis" and gender disagree. Although no assumption was made about the influence of "gender," it seems important for this equation. We can conclude. The lower the score for the possibility of eco-crisis and gender, the higher the score for organic food percentage. Because males were represented with a 1, females a 2, other 3 and prefer not to say 4, this result indicates that more males than females and others purchase organic food. This is contradicting to the literature review, which stated that females are more environmentally cautious, which would imply them to purchase more organic food. The findings are also only valid for this sample and cannot be applied to the population of Austria as it is not representative. The p-value indicates that all variables are significant, as they are below the significant cut-off point of

0.05. As for the collinearity statistics, the Variance Inflation Factor (VIF) is excellent, below 10 for all variables. The tolerance is also excellent, as it is above 0.2 and shows that the values are not closely linked, which gives them individuality.

4.4.2 Regression Model 2

Linear Regression

Model Fit Measures

Model	R	R ²
1	0.350	0.123

Model Coefficients - Percentage fruit and vegetable organic

Predictor	Estimate	SE	t	p	Stand. Estimate
Intercept	5.858	1.666	3.52	<.001	
Limits of growth	0.393	0.290	1.36	0.178	0.160
Possibility eco-crisis	-0.593	0.323	-1.84	0.070	-0.221
Personal responsibility	0.956	0.325	2.94	0.004	0.585
Health motivation	-0.812	0.302	-2.69	0.008	-0.527
Age	0.497	0.289	1.72	0.089	0.173

Assumption Checks

Collinearity Statistics

	VIF	Tolerance
Limits of growth	1.47	0.681
Possibility eco-crisis	1.51	0.661
Personal responsibility	4.15	0.241
Health motivation	4.02	0.249
Age	1.06	0.947

Figure 3: Linear Regression model – percentage fruit and vegetables organic

Figure 3 shows the linear regression between the percentage of organic fruit and vegetable and the constructs: "Limits of Growth," "Possibility eco-crisis," "Personal responsibility," "Health motivation," and "Age." As explained in the previous model, the R² shows that this model explains 12.3% of the variance in organic food purchasing. The previous model could establish an equation for the composite of organic food percentage. Because this model predicts the food

category for fruit and vegetables organic, another equation can get designed. An equation for the composite percentage for organic food was constructed like the previous model. This model digs deeper and allows establishing an equation for one food group, the percentage of fruit and vegetable organic. With the estimate and the independent variables, the following equation can be established: $5.858 + (0.393 * \text{Limits of growth}) - (0.593 * \text{Possibility eco-crisis}) + (0.956 * \text{Personal responsibility}) - (0.812 * \text{Health motivation}) + (0.497 * \text{Age}) = \text{Percentage fruit and vegetable organic}$. Furthermore, the Std. Estimate shows that "Limits of growth," "Personal responsibility," and "Age" agree with the expectations. Therefore, the higher the score for "Limits of growth," "Personal responsibility," and "Age," the higher the score for the percentage of fruit and vegetables organic.

On the other hand, "possibility eco-crisis" and "health motivation" disagree with the expectations. Therefore, the lower the score for "possibility eco-crisis" and "health motivation," the higher the score for the percentage of fruit and vegetable organic. The p-value is significant for "Personal responsibility" and "health motivation." Possibility eco-crisis" and "Age" are close enough to be significant, and "Limits of growth" is not significant. However, when conducting the regression analysis, "Limits of growth" showed a significant effect on the significance of other variables and are therefore included in this model. As for the collinearity analysis, the VIF is suitable for all variables. "Personal responsibility" and "Health motivation" have a higher VIF than other variables. Their score is nevertheless under ten and therefore acceptable. The tolerance is also acceptable for all variables as they are above 0.2.

4.4.3 Regression Model 3

Linear Regression

Model Fit Measures

Model	R	R ²
1	0.353	0.124

Model Coefficients - Percentage bread and cereals organic

Predictor	Estimate	SE	t	p	Stand. Estimate
Intercept	10.770	1.781	6.05	<.001	
Fragility Nature Balance	-0.631	0.298	-2.12	0.037	-0.205
Gender Comp.	-1.480	0.551	-2.68	0.009	-0.260

Assumption Checks

Collinearity Statistics

	VIF	Tolerance
Fragility Nature Balance	1.02	0.982
Gender Comp.	1.02	0.982

Figure 4: Linear Regression model - Percentage bread and cereals organic

The third and final model to be discussed is the regression analysis between the percentage of bread and cereals bought organic and the Fragility of Nature Balance with Gender. According to the R² value, this model explains 12,4% of the variance in organic food purchasing. Through the Estimate and predictor variables, the following equation can be established.: $10.770 - (0.631 * \text{Fragility of Nature}) - (1.480 * \text{Gender}) = \text{Percentage bread and cereal organic}$. As shown by the Std. Estimate, the independent variables, "Fragility Nature Balance" and "Gender," disagree with the assumption. This disagreement concludes with: The lower the score for "Fragility Nature Balance" and "Gender," the higher the score for "percentage of bread and cereal." The p-value for both independent variables is significant, indicating a reliable result. The collinearity statistic further shows a low score for the VIF, which is good, and a high score for the tolerance, which is also good.

4.5 Discussion

The numeric data collected, showed to have no significance for the most part, with a minor correlation and relationship. As tested in the correlation matrix, the individual constructs showed a weak correlation with the percentage of organic food in the diet. This could be explained by the data not being representative of the larger population as a convenience snowball sampling technique was used. The results obtained for this section showed to not be consistent with the research from the literature review.

In addition to the numeric data collection, two qualitative open-ended questions were asked about the reason for buying organic food products. It must be noted that these questions were asked before the questions for health and environmental attitudes to ensure that the idea of health and environment would not influence their opinion. Many replies supported the expectations of this research, that there is a relationship between the buying behavior of organic food and health and environmental attitudes. They replies included reasons such as: "Health", "They are healthier and often seem to have more nutrition's", "Health and environmental reasons", "not so many chemicals", "Better for nature", or "Better for the environment". It can be noted that most of the respondents reported their own health and a better feeling to be the reason for buying organic food. These results are in unison with the assumptions made in the research. On the other hand, different reasons were mentioned as well. "Better quality", "Because it tastes better", "I was raised that way" are some examples. This finding could be a possible explanation for the data collected not being significant as many might not buy organic products because of environmental or health reasons but others, such mentioned above. It must however be stated that despite the numeric data collection not being consistent with previous research, the data obtained from the open-ended questions is.

5. Conclusion and findings

With the data collected through the online survey, an insight into the buying behavior towards organic food was gained, even though the data collected was not significant. The following sections will discuss and analyze these findings and conclude this research paper.

The purpose of this research was to find out the effects of environmental attitudes and health attitudes on the purchase behavior of organic food. For that purpose, two scales were used to measure these attitudes for the survey. These scales have several constructs within, which measure different parts of the participants health and environmental attitudes. For environmental attitudes, the NEP scale measures the constructs: Limits of growth, Anti-Anthropocentrism, Fragility of Nature Balance, Rejection Exceptionalism and Possibility of eco-crisis. As for the health attitudes scale the constructs measured are: Self-health awareness, personal responsibility, and health motivation. These constructs together comprise the two independent variables. As for the dependent variables, five were tested for: Percentage of Meat organic, Percentage of fruit and vegetables organic, Percentage of dairy organic, Percentage of grain organic and the fifth dependent variable, which is the aggregate of those food category percentages.

Also, with the help of the dependent variables and the proportion of meals, valuable insight was gained into the organic food buying behavior. As previously stated, the participants mostly paid attention towards buying fruit and vegetables as well as meat products organic. Fruit and vegetables also had the highest proportion in the meals of the participant's diet. Meat on the other hand accounted for the lowest proportion of meals, but next to fruit and vegetables the highest product bought organic. Dairy and grain products accounted for the least organically bought categories, but after fruit and vegetables, the most consumed.

The first variables that were tested for were the aggregated NEP questions with the aggregate for the organic food percentages. Thereby, the effects of environmental attitude on organic food purchase behavior were tested for. For the research, the assumption was that a high score for environmental attitude leads to a high score on organic food purchase behavior. The data collected showed to have no relationship as well as no significance between each other. This means, that the assumption is rejected and that a high score for environmental attitudes leads to a high score for organic food

purchase behavior. Because of this result, the individual constructs of the NEP questions were analyzed.

As for the second variables, the aggregate of health questions with the aggregate of organic food percentages were analyzed. Thereby, the effects of the health attitude on organic food purchase behavior were tested for. The assumption was a high score for health attitudes leads to a high score for organic food purchase behavior. As for the first analysis, the collected data also showed no relationship and significance between these variables. This results in rejecting the assumption that a high score for health attitude leads to a high score for organic food purchase behavior. Because of this result, the individual constructs of the health scale were analyzed.

The analysis was conducted through a linear regression. Out of all regression analysis conducted, three models showed a solid enough prediction and significance for the independent variables.

The first model deals with the effects of the construct's limits of growth, possibility eco-crisis and gender in on the aggregate of the percentage of organic food. The results indicate that the construct limits of growth agree with the assumptions made. On the other hand, the constructs possibility of eco-crisis and gender disagree with the assumption.

As for the second model, it deals with the construct's limits of growth, possibility of eco-crisis, personal responsibility, health motivation and age. After conducting the data analysis, the results showed that the concepts of limits of growth, personal responsibility and age agree with the assumptions made. On the contrary, the constructs for possibility of eco-crisis and health motivation disagree with the assumption.

The last model comprises the effect of the construct fragility of nature and gender on the percentage for organic bread and cereal. Surprisingly, the model showed a negative value which indicates a disagreement for the assumption for both constructs.

5.1 Theoretical Implications

The goal of this research was to answer the question: “What effect do health attitudes and environmental attitudes have on the purchase behavior of organic food.” The data obtained by the survey to answer this question provided valuable insight into the topic, even though it showed no significance for the most part.

The results obtained showed that this research is moderately suitable to understand the effects of health and environmental attitudes on the purchase behavior of organic food. The research concluded that not the health and NEP scales, which were taken to measure the attitudes, effect the purchase behavior of organic food, but the individual constructs included in those scales. It can therefore be said that there are some positive and negative effects between those attitudes and purchasing organic food.

The research has proven, that to some extent, the construct limits of growth have a positive effect on the percentage of organic food, as well as the percentage of fruit and vegetables bought. One’s personal responsibility also positively influences the purchase behavior of organic fruit and vegetables. On the other hand, there is a negative correlation between the amount of organic food purchased and possibility of eco-crisis, health motivation and fragility of nature balance.

From the data acquired in the literature review, it could be concluded that a higher environmental attitude should lead to a lower consumption of organic meat, as organic meat is worse for the environment. Interestingly, the opposite could be reported from the survey, which showed a higher consumption for organic meat. A possible explanation for this phenomenon could be that the consumers are more concerned about animal welfare or food safety and thereby forget the impact on the environment.

The data obtained also points out, that there are individual parts within health and environmental attitudes that influence the purchase behavior. But because there was no clear relationship between those attitudes itself, these variables have been rejected.

One possible explanation for this rejection could be the limited sample size. Another explanation is that the sampling technique did not represent the Austrian population. This issue lies in the snowball sampling technique. Through this technique, the survey got sent to a group of people with certain attitudes. These people then went on to send it most likely to their friends, who have similar attitudes as they have. Therefore, the survey lacks variation as respondents with similar attitudes continue to fill out the

survey, which results in a very monotone result, which is not representative of a larger population. Additionally, because the survey was shared on a private Instagram account and with contacts familiar with the researcher, the target population could have been missed, leading to the sample not being representative. Lastly, the questions measuring the purchase behavior of organic food could have been the reason for such missing relationship, as they were not retrieved from a validated scale.

That the data was not significant, and representative of the Austrian population was not expected when conducting this research. Furthermore, that the regression models created showed little explanation of the dependent variables was also not expected. Due to these circumstances, further research on this topic must be conducted to clearly state the effects between the variables. To ensure the accuracy of the data for future research, the researcher could ask the participants to keep a food diary obtaining everything eaten in a day and whether it was organic. This could also be done through a food tracking app. Other methods could include keeping receipts of the supermarket purchases.

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7. Appendices

7.1 Survey structure

I am a student at Modul University whose research seeks to understand the drivers for the purchase of organic food. If you participate in this survey, you will be asked questions related to your demographic profile, food purchasing behaviors, and various attitudes you hold.

After completing the survey, you can optionally type in your email address to enter in a €25 Netflix gift card give away. If requested, the final thesis can also be sent to those interested.

The time required to complete the survey is estimated at **10 minutes**. All data collected will be held and processed securely in accordance with current data protection regulations and you will not be identifiable at any stage.

Your voluntary participation is greatly appreciated.

7.1.1 Questions to measure the purchase behavior towards organic food

Meat:

Each week, how many of your breakfasts contain meat?

Each week, how many of your lunches contain meat?

Each week, how many of your dinners contain meat?

What percentage of the meat you buy is certified as organic?

Dairy:

Each week, how many of your breakfasts contain dairy?

Each week, how many of your lunches contain dairy?

Each week, how many of your dinners contain dairy?

What percentage of the dairy you buy is certified as organic?

Fruit and vegetables:

Each week, how many of your breakfasts contain fruit and vegetables?

Each week, how many of your lunches contain fruit and vegetables?

Each week, how many of your dinners contain fruit and vegetables?

What percentage of the fruit and vegetables you buy is certified as organic?

Bread/ cereals (grain):

Each week, how many of your breakfasts contain bread and cereals?

Each week, how many of your lunches contain bread and cereals?

Each week, how many of your dinners contain bread and cereals?

What percentage of the bread and cereals (grain) you buy is certified as organic?

7.1.2 Open-ended questions

Why do you buy the organic foods you buy rather than alternatives?

What stops you from buying more organic food?

7.1.3 Questions to measure the environmental attitudes

New Ecological Paradigm - scale:

1. We are approaching the limit of the number of people the Earth can support.
2. Humans have the right to modify the natural environment to suit their needs.
3. When humans interfere with nature it often produces disastrous consequences.
4. Human ingenuity will insure that we do not make the Earth unlivable.
5. Humans are seriously abusing the environment.
6. The Earth has plenty of natural resources if we just learn how to develop them.
7. Plants and animals have as much right as humans to exist.
8. The balance of nature is strong enough to cope with the impacts of modern industrial nations.
9. Despite our special abilities, humans are still subject to the laws of nature.
10. The so-called "ecological crisis" facing humankind has been greatly exaggerated.
11. The Earth is like a spaceship with very limited room and resources.
12. Humans were meant to rule over the rest of nature.
13. The balance of nature is very delicate and easily upset.
14. Humans will eventually learn enough about how nature works to be able to control it.
15. If things continue on their present course, we will soon experience a major ecological catastrophe.

These questions will be asked using a 7-point Likert scale, coded from 1 = strongly disagree to 7 = strongly agree with 4 = neutral

The questions can be divided into 5 dimensions: 1. Reality to limits of growth, 2. Anti-Anthropocentrism, 3. Fragility of Nature's Balance, 4. Anti-exceptionalism, 5. Possibility of an eco-crisis

7.1.4 Questions to measure the health attitudes/ health consciousness

Questions for the health consciousness:

1. I'm very self-conscious about my health.
2. I'm generally attentive to my inner feelings about my health.
3. I reflect about my health a lot.
4. I'm concerned about my health all the time.
5. I notice how I feel physically as I go through the day.
6. I take responsibility for the state of my health.
7. Good health takes active participation on my part.
8. Living life without disease and illness is very important to me.
9. My health depends on how well I take care of myself.
10. Living life in the best possible health is very important to me.

These questions will be asked using a 7-point Likert scale, coded from 1 = strongly disagree to 7 = strongly agree with 4 = neutral

These questions can be divided into 3 dimensions:

1. Self-health awareness, 2. Personal responsibility, 3. Health motivation