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Exploring the distinction between innovation adoption and resistance in the context of meat substitutes

Master's Thesis

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Preface

Dear reader,

I would like to present to you my Master's thesis on the topic of innovation resistance and adoption. After a very challenging year, I am proud to have had the opportunity to complete this research. I could not have done it without the careful guidance of my supervisor, prof. Dr. Bas Hillebrand, who has provided me with the confidence to finish this project. I would also like to thank my thesis circle group with whom I had the opportunity to learn from and work closely with. Last but not least, I would like to express my gratitude to my friends and family who have tirelessly supported me through this process and always believed in me.

Thank you to everyone and hopefully you will enjoy reading my work.

Natalia Cervantes
Utrecht, August 2022

Abstract

The aim of this study was to investigate the distinction between innovation adoption and resistance in the context of meat substitutes. The topic of innovation adoption is widely studied since new innovations are costly to develop and launch to the market. However, in the topic of innovation adoption, innovation resistance is often overlooked. Research and practitioners both often view the resistance and non-adoption as simply opposites. This study builds upon previous innovation resistance literature to investigate the relationship between adoption and resistance and their antecedents. A survey was conducted to collect data on adoption and resistance antecedents to then test hypotheses relating to both using multiple linear regression. Findings show that perceived healthiness, green perceived value and animal welfare are good predictors of adoption of meat substitutes, while resistance is related to the perceived unnaturalness of the product. Contrary to the central idea of this research, adoption and resistance appear to be opposites of each other, as they share antecedents.

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1. Introduction

1.1 Problem Introduction

Innovations are a major driver of a firm's competitive advantage and survival. Firms can seldom get by without introducing innovative products, services or altering their service in an innovative way (Kleijnen et al., 2009). This is due to the ever-changing markets and fickle consumer trends. Simply expanding and increasing the budgets for research and development departments does not, however, guarantee products' market success. Firms may come up with innovative ideas of products or services that meet consumers' needs and solve their problems, and yet are not adopted.

Despite the current "pro-innovation" climate, which suggests that all innovations are superior to their predecessors and should be accepted in the market, most innovations that enter the market fail to succeed (Laukkanen, 2016). One reason for this failure may be that many innovations are met with resistance. This resistance from consumers is one of the major causes of the high market failure of innovations (Ram & Sheth, 1989).

While a wide array of literature covers the antecedents and outcomes of innovation adoption, these findings do not necessarily apply to innovation resistance (Talke & Heidenreich, 2014; Chatzidakis & Lee, 2013; Claudy et al., 2015). Most researchers have studied the motivations of adoption but have neglected the triggers of resistance to innovation in their studies and vice versa. Resistance can occur at any stage of the innovation process, even after it has been adopted (Kuisma et al., 2007). In order to understand how innovations can be adopted, researchers must also understand the concept of resistance and how to overcome it.

Consumers' reasons for resisting an innovation may not necessarily be the opposite as the reasons for its adoption (Claudy et al., 2015). For example, while certain consumers may purchase electric vehicles due to their environmental benefits, it is unlikely that others would oppose electric vehicles because they want to damage the environment (Chatzidakis & Lee, 2013; Claudy et al., 2015). Although the terms non-adoption and resistance are sometimes used

interchangeably in the context of innovations, they may be different concepts (Cham et al., 2021).

The current literature frequently frames resistance as the lack of adoption. Empirical studies often fall into the trap of identifying a lack of drivers for adoption as resistance, thus suggesting that the two are just polar opposite of the same scale (Kleijnen et al., 2009). The added value of this study is, therefore, to provide clarity on the conceptualization of resistance, as well as to determine whether resistance is truly the opposite of adoption. The antecedents of adoption and resistance will be determined and empirically tested within the context of meat substitutes. With that considered, the research question of this study is stated as follows:

How do perceived innovation characteristics of meat substitutes affect adoption and resistance, and are the two constructs qualitatively different?

1.2 Relevance

In order to stay relevant and ahead of the competition, firms must keep up with customer demand as well as tap into new markets. If not, established firms risk being outperformed by new entrants as was the case with, for example, Kodak and the digital technology transition (Lucas & Goh, 2009). Given the importance of innovations for survival, firms heavily invest in market research to identify the factors determining new product success.

Therefore, the social relevance of this research is for marketing and general managers. Firms invest extensive time and financial resources into the R&D process for a new product and perform calculated risk evaluations of the product's projected success (Huang et al., 2021). These forecasts are often focused on whether the product will be adopted or not, while overlooking the possible product/service characteristics that could trigger resistance. For example, genetically modified (GMO) foods have caused controversy when introduced to the market as they challenged the consumers' norms and views on produce (Kleijnen et al., 2009). This study argues that managers should also consider the drivers of resistance rather than only inhibitors of adoption, especially in the context of green innovations as that is the context of this study.

With a better understanding, marketing managers can identify the appropriate drivers of resistance to the said product and craft marketing campaigns and strategies to overcome the resulting barriers. Alternatively, managers can identify the drivers of resistance and prevent the useless waste of resources on projects that are forecasted to result in a high level of resistance. This is especially crucial in the field of green innovations where product development is often costly (Huang et al., 2021).

Most literature on innovation adoption has focused on successful innovations while a large percentage of innovations are never successful on the market. From an academic point of view, empirical studies that investigate either resistance or adoption should be able to distinguish whether they are conceptually different. These two terms are however often used interchangeably, as seen in Table 1. Similarly, to the concepts of satisfaction and dissatisfaction that were assumed to be symmetrical, the relationship between resistance and adoption is often assumed to be linear (Patsiotis et al., 2013). This study aims to fill that gap by shedding light on the adoption-resistance relationship. Lastly, a more comprehensive conceptual understanding of the antecedents of adoption and resistance can lead to better marketing strategies to lead green innovations such as meat substitutes to market success (Castro et al., 2019).

1.3 Structure of research paper

The objective of this paper is to whether adoption and resistance are simply opposites or whether they are differing concepts. Firstly, the study will discuss the differences in literature concerning the notions of resistance and adoption. From then on, the main conceptualisations of resistance will be discussed. Using theoretical and contextual grounds, the hypotheses on the relationships between the perceived characteristics of meat substitutes and adoption and resistance will be developed. In Chapter 3 the methods and data collection will be discussed, followed by chapter 4 where a multiple regression will be performed to test the hypotheses. Lastly, the results will be summarised and discussed in Chapter 5.

2. Theoretical Framework

2.1 Innovation adoption and resistance

Innovation can be defined as current patterns of products or consumption undergoing a change (Gatignon & Robertson, 1989). The multi-stage response of consumers to innovations can be described as an adoption decision process (Claudy et al., 2015). If this adoption decision process concludes with the consumer accepting and utilising the novel product, then the innovation has been successfully adopted (Roberston, 1971; Rogers, 2003).

The majority of innovations are rejected by consumers despite companies' efforts to include customers in the new product development process to meet their needs (Kleijnen et al., 2009). While innovations are vital for an organisation's success, research shows that 40-90% of new innovations are never successful in the market or take years before being accepted by the general public (Gourville, 2006). One reason may be that consumers tend to resist new innovations as these force people to change their existing habits, views, and norms. Resistance to innovation can therefore be seen as a form of resistance to change (Oreg, 2003; Khanra et al., 2020).

Traditional innovation adoption studies fail to account for the innovation resistance experienced by consumers in their models. Studies seldom distinguish between adoption and resistance since researchers often assume that they are antagonistic of each other (Kleijnen et al., 2009). However, more recent literature suggests that motives between (non-)adoption and resistance of consumers differ qualitatively (Claudy et al., 2015). These differences in conceptualization are illustrated in Table 1 below.

Table 1: Prior literature contradictions on the conceptualizations of adoption and resistance

Author	**Conceptualisation of resistance**	**Adoption vs Resistance**
Ram & Sheth, 1989	*"Innovation resistance is the resistance offered by consumers to an innovation, either because it poses potential changes from a satisfactory status quo or because it conflicts with their belief structure" -p.6*	**Not opposite**
Gatignon & Robertson, 1989	*"Rejection as an outcome of the decision process (rather than adoption)"*	**Not opposite**
Kleijnen et al., 2009	*"...three distinct types of consumer behaviour: rejection, postponement, and opposition" -p345*	**Not opposite**
Distel, 2020	*"...address phenomena of resistance or non-adoption."; "...aim at explaining non-adoption of or resistance to IT."*	**Opposite**
Cadwell et al., 2018	*"...adoption by professional translators still meets with resistance. Research on the human factors associated with MT (non-)adoption is required to understand this state of affairs."*	**Opposite**
Ullah et al., 2021	Identifies resistance as technological, organisational and environmental barriers to adoption.	**Opposite**
Eckhardt et al., 2009	The impact of 'resistance to change' on IT non-adopters is supported for groups on the organisational level	**Opposite**
Reinhardt et al., 2017	Definition of Ram & Sheth, 1989. Recognise the difference between resistance however use non-adoption and resistance interchangeably.	**Interchangeable/ Opposite**

While there is extensive research for both adoption and resistance streams, it is unclear whether the adoption and resistance differ or whether they are simply opposites (Claudy et al., 2015; Day and Herbig 1992; Garcia et al., 2007). Some claim that the factors that explain resistance are not the same as the ones explaining non-adoption and are also not the opposite of adoption (see Table 1). This means that adoption and resistance can both be present during a customer adoption cycle (Mani & Chouk, 2018). As seen in Table 1 however, a large portion of the empirical resistance and adoption research has used the two terms as polar opposites, interchanging the terms "resistance" and "non-adoption" (Kleijnen et al., 2009).

Resistance has been defined as an attempt to maintain the status quo when faced with a change (Mani & Chouk, 2018; Ram and Sheth, 1989). This mainstream definition simply defines innovation resistance as itself (Kleijnen et al., 2009). What distinguishes resistance from non-adoption is that it is a conscious decision to avoid and at times maybe even be hostile towards innovations. Non-adoption on the other hand, leaves a possibility of future use (Eckhardt et al., 2009).

Other conceptualisations of resistance have focused on the differentiation between the passive and active forms of resistance (Heidenreich & Handrich, 2015). Others have described resistance as a hierarchy (Kleijen et al., 2009). The concept of resistance has also been studied as a three-dimensional construct encompassing cognition, affect, and behaviour (Breckler, 1984; Castro et al., 2019). The following conceptualisations will now be discussed separately in order to determine the most appropriate definition of resistance for the study.

Resistance can be conceptualised in varying degrees. This framework classifies resistance into a hierarchy: 1) postponement; 2) rejection; 3) opposition. The degrees in the resistance hierarchy differ in nature by their respective antecedents (Kleijnen et al., 2009). This resistance hierarchy however, is more of a tool to illustrate consumer's perception of resistance rather than a conceptualisation of resistance itself.

Studies often distinguish between two types of resistance: active innovation resistance and passive innovation resistance (Heidenreich & Handrich, 2015). The distinguishing factor

between the two types of resistance is that active resistance occurs after product evaluation and passive resistance occurs prior to the product evaluation and is more of an individual's satisfaction with the status quo and inclination to resist change (Castro et al., 2019; Salawu et al., 2019). Active resistance is product-related, at times deliberate and as a result, can be counteracted (Castro et al., 2019). Since passive resistance is more of a result of consumer's inertia rather than product appraisal, this study will focus on active resistance.

Based on Breckler's (1985) tripartite model of attitude, resistance can be composed of emotional, cognitive and behavioural components. Behavioural resistance is expressed with overt actions and behavioural intentions towards the innovation. Cognitive resistance is reflected in the belief and perceptual responses to the innovation (Breckler, 1985). Lastly, affective resistance encompasses consumer's mood and emotion (Castro et al., 2019). The affect component of resistance is elicited when the evaluation of the innovation leads to emotional barriers to adoption (Breckler, 1985; Castro et al., 2019).

The same three-dimensional model can be applied to adoption, to measure the emotional, cognitive and behavioural adoption (Raffaelli, Glynn & Tushman, 2019). Adoption in this study is therefore defined as a three-dimensional construct encompassing:

1. Behavioural adoption caused by actions and intentions resulting from evaluating an innovation (Breckler, 1985).
2. Cognitive adoption caused by thoughts and beliefs resulting from evaluating an innovation (Raffaelli et al., 2019).
3. Affective adoption caused by feelings and sentiments resulting from evaluating an innovation (Raffaelli et al., 2019).

Early diffusion of innovation literature focuses largely on the perceived characteristics of innovations (Rogers, 2003). Adoption literature has predominantly relied on Rogers' (2003) work, in which the author distinguished five adoption factors to help predict the likelihood of adoption. As shown in Table 2, each adoption factor is an attribute of the innovation, thus the

factors are considered to be part of the innovation decision process and do not explain why a consumer actually adopts or resists an innovation (Patsiotis, Hughes & Webber, 2013).

Table 2 - Antecedents of Adoption (Rogers, 1962)

Concept	**Factor**	**Description**
Innovation Attributes	Relative advantage	the degree to which the innovation outperforms the current product (Rogers, 1962).
	Compatibility	the degree to which the innovation is consistent with the consumers' lifestyle (Rogers, 1962).
	Complexity	the degree to which the innovation is difficult to use or understand by the consumer (Rogers, 1962).
	Trialability	the degree to which the innovation is easy to try out by the consumer (Rogers, 1962).
	Observability	the degree to which the innovation is difficult to disseminate by the consumer (Rogers, 1962).

Later studies have successfully combined the model of Rogers (2003) with the theory of reasoned action (TRA) and its successors, the theory of technology acceptance (TAM) and the theory of planned behaviour (TPB) (Fishbein & Azjen, 1975; Davis, 1989; Azjen, 1991). Together, these models incorporated additional constructs such as "perceived ease of use" and "perceived usefulness" to illustrate the consumers perception on the outcome of adopting the innovation (Patsiotis et al., 2013). The TPB model also suggests that an individual's intention to perform a behaviour is a valid indicator of actual behaviour, thus allowing the following study to use adoption and resistance intention as a proxy to adoption and resistance respectively (Azjen, 1991).

Similarly to innovation adoption literature, existing literature on innovation resistance largely relies on the early model of resistance antecedents by Ram and Sheth (1989). As seen in Table 3, the model includes innovation attributes but rather than factors of adoption (as was in Rogers' (2003) model), they are barriers to adoption. By definition, some of these barriers overlap with

the adoption factors, indicating that the context of the innovation is crucial in determining the perceived innovation attributes.

Table 3. Antecedents of Resistance (Ram & Sheth, 1989)

Concept	Factor	Description
Functional Barrier	Usage Barrier	Degree to which the innovation changes existing habits (Ram & Sheth, 1989; Kleijnen et al., 2009).
	Value Barrier	Degree to which the innovation outperforms the existing product or service (Castro et al., 2019).
	Risk Barrier	Degree of uncertainty associated with adopting the innovation.
Psychological Barriers	Tradition and Norm Barrier	Degree to which the innovation causes a cultural change or deviation from tradition (Ram & Sheth, 1989).
	Image Barrier	Degree to which the innovation has an unfavorable image (Ram & Sheth, 1989).

2.2 Antecedents of Innovation Adoption and Resistance

Conceptually informed by both adoption and resistance models as well as the intention-behaviour relationship, in the following section the antecedents of adoption and resistance of meat substitutes will be discussed (Rogers, 1962; Ram & Sheth, 1989; Azjen, 1991). Due to the overlap between the adoption and resistance antecedents in the models of Rogers and Ram and Sheth respectively, the antecedents in this study are informed by both the context and theoretical framework.

A comprehensive review of a number of studies that primarily utilised the aforementioned attitude-behaviour theories, has linked positive attitudes towards purchasing meat substitutes to the beliefs about the substitutes' health, animal welfare and environmental aspects (Weinrich, 2019; Thøgersen & Zhou, 2021). These three main drivers of meat substitute acceptance will be further discussed as the antecedents of adoption. In contrast, research shows that due to consumers' preference towards natural products, many display resistance to highly processed

meat substitutes (Hwang et al., 2020). Lastly, one of the resistance antecedents incorporated into the later models which built upon Rogers (1962) and is relevant to the context of food innovation, is perceived voluntariness (Moore & Benbasat, 1991). Perceived unnaturalness and voluntariness will be further explored as antecedents of resistance.

2.2.1 Perceived Healthiness

Previous research on food products has shown that the products that are perceived to be healthier are more likely to be purchased by the consumer (Steinhauser et al., 2019; Thøgersen & Zhou, 2021). The term perceived healthiness can be defined as "a consumer's expectation of a product's influence on his or her state of health" (Plasek et al., 2020).

Since meat substitutes closely resemble actual meat, the packaging often reflects the health benefits that are associated with meat while highlighting meat's health shortcomings (Martin et al., 2021). Packaging of meat substitutes will often include the high plant protein and low saturated fat content in order to present to the consumer as the healthier option (Plasek et al., 2020; Martin et al., 2021). These tactics show that the perceived healthiness of a product influences consumer adoption decisions, in particular concerning food products. Following the theoretical framework which suggests an asymmetrical relationship between adoption, the following hypothesis is two-fold:

H1a: Perceived healthiness has a positive influence on the adoption of meat substitutes.
H1b: Perceived healthiness has a weak to no influence on the resistance of meat substitutes.[1]

2.2.2 Green Perceived Value

With the global population rapidly increasing, the demand for high quality protein is exceeding sustainable production capabilities. Meat has long been the main primary source of protein but due to its high carbon footprint many consumers have turned to meat substitutes as they are perceived to have a higher green value (Kumar et al., 2017). Green perceived value can be defined as the 'consumers' overall appraisal of the net benefit of a product or service between

[1] It is important to note that while a hypothesis indicating a weak to no relationship is highly unusual, it is crucial in the context of this research.

what is received and what is given based on the consumer's environmental desires, sustainable expectations, and green needs' (Chen & Chang, 2012).

Despite the long standing general consensus that meat production is unsustainable, it has only recently been reflected in consumers' purchases. Once this awareness has been reached however, consumers' take the green perceived value into account when trying novel products such as meat substitutes (Siegrist & Hartmann, 2019). A consumer may choose to purchase meat substitutes due to the relative advantage of decreasing their environmental impact, compared to purchasing meat products that are responsible for higher carbon emissions (*H3a*) (Siegrist & Hartmann, 2019; Weinrich, 2019). However, a consumer who resists meat substitutes probably does not do so because they want to harm the environment (*H3b*) (Chatzidakis & Lee, 2013). Following these findings, leads to the hypotheses:

H2a: Green perceived value has a positive influence on the adoption of meat substitutes.
H2b: Green perceived value has a weak to no influence on the resistance of meat substitutes.

2.2.3 Animal Welfare

In the last decades, there has been a shift of values towards a more post-materialistic outlook on consumerism (Boogaard et al., 2006). These values are reflected in consumers' demands of the livestock production systems to meet animal welfare standards (Boogaard et al., 2006). However, with an increasing population and growing food demands, it is challenging to meet food security targets while retaining animal welfare standards (Kumar et al., 2017). A consumer's concern for animal welfare can be defined as the degree to which the choice one makes is supporting animal protection and better animal treatment (de Jonge & van Trijp, 2013).

The issue with current animal welfare practices has to do with the unethical treatment of animals during rearing, transportation and slaughter (Kumar et al., 2017). Consumers have begun to link the cruelty of animal slaughter to meat products and turned to meat substitutes as a more ethical alternative (Jahn et al., 2021). A recent study found that animal welfare is the main reason for consumers to adopt meat substitutes in their diet (Fresán et al., 2020). Conversely, a consumer is not likely to actively resist meat substitutes in hope of harming animals (Jahn et al., 2021).

H3a: Animal welfare has a positive influence on the adoption of meat substitutes.
H3b: Animal welfare has a weak to no influence on the resistance of meat substitutes.

2.2.4 Perceived Voluntariness

Researchers argue that when studying the diffusion of innovations one must also take into account whether the choice the consumer makes is under the consumer's volitional control (Moore & Benbasat, 1991; Plouffe et al., 2001). The degree of voluntariness varies with, for example, an extreme being a mandatory policy to use a new innovation at an individual's firm restricting the choice to adopt or reject an innovation. In this case, the degree of voluntariness that the user has is very low (Moore & Benbasat, 1991).

In most studies, when adoption is not strictly mandatory, studies assume that all adopters are voluntary. However, adopters may still feel a compulsion or pressure to adopt an innovation despite it not being mandatory (Moore & Benbasat, 1991). A determinant of behavioural intention is a subjective norm, which enocompasses the perceived external pressure that individuals feel when deciding to behave a certain way (Ajzen & Fishbein, 1980; Agarwal & Prasad, 1997). In empirical applications of information technology cases, perceived voluntariness was also shown to have a significant effect on consumers' resistance to innovation (Agarwal & Prasad, 1997; Moore & Benbasat, 1991).

H4a: Perceived voluntariness has a negative influence on the resistance of meat substitutes.
H4b: Perceived voluntariness has a weak to no influence on the adoption of meat substitutes.

2.2.5 Perceived Unnaturalness

When evaluating consumer's food choices, the matter of whether the food is natural, organic or 'bio' has become increasingly important. Consumer's value food that comes directly from nature and have been found to have a negative response to terms such as 'made in a laboratory' or 'using biotechnology', when it comes to food products (Hwang et al., 2020). The same applies to meat substitutes, especially since many new meat substitutes on the market are highly processed in order to closely resemble real meat (Jahn et al., 2021). These production methods

may appeal to some of the consumer's values discussed previously, such as being more environmentally friendly and better for animal welfare. Despite this, the perceived lack of naturalness may trigger some consumer's to resist meat substitutes in their daily diet (Siegrist & Sütterlin, 2017). This leads to the following hypotheses:

H5a: Perceived unnaturalness has a positive influence on the resistance of meat substitutes.
H5b: Perceived unnaturalness has a weak to no influence on the adoption of meat substitutes.

Lastly, the study aims to differentiate between the concepts of adoption and resistance. If the concepts are the same, suggesting that resistance is simply the lack of adoption, one would expect a strong negative relationship between the concepts. The lack of adoption would increase the level of resistance and vice versa. However, if the concepts are qualitatively different there would be a weak to no relationship expected (*H6*).

H6: There is a weak to no relationship between adoption and resistance.

The aforementioned hypothesis leads to the following conceptual model, where the dotted lines represent weak to no relationships:

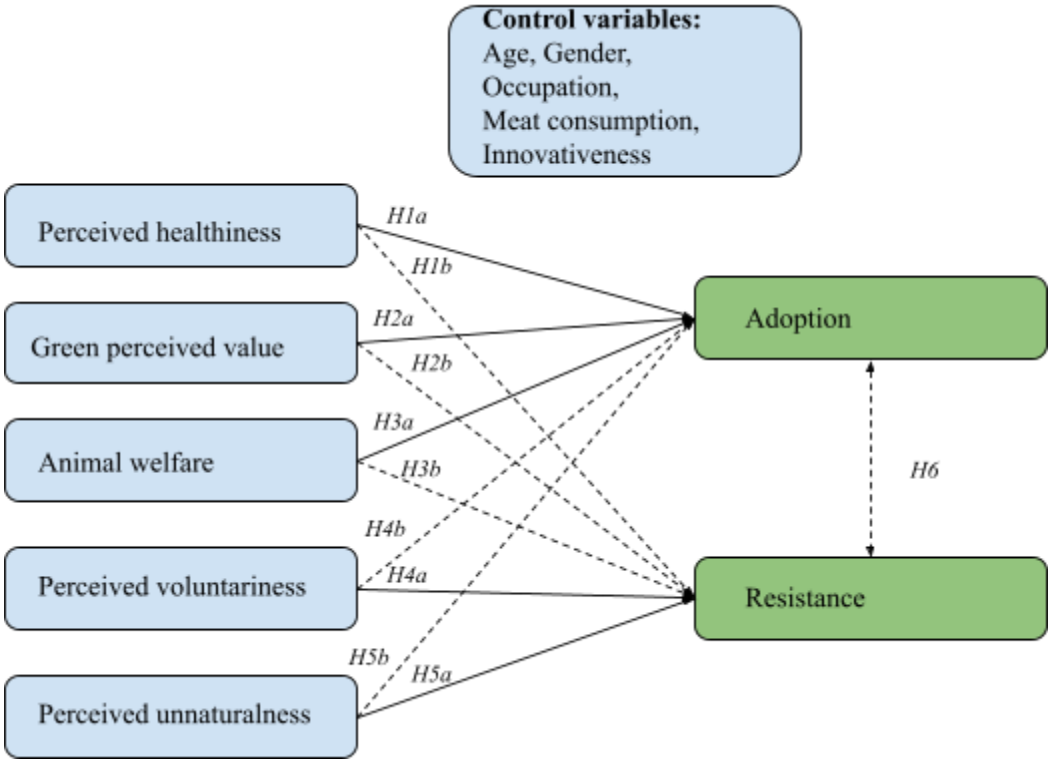

Figure 1. Conceptual Model

3. Methodology

In the following chapter the methodology of the study is outlined. Chapter 3 will read as follows: first the research design will be described, followed by an operationalisation of constructs and a justification of control variables. Then, the sample and target population will be described as well as methods of data collection. Finally, the results of the pre-tests of the survey are presented together with construct reliability and validity measures.

3.1 Research Design

In order to perform the research, a deductive research approach was undertaken to explore the conceptual difference between resistance and adoption (Field, 2013). The aim of this study is to answer the research question by means of testing the aforementioned hypotheses. The hypotheses have been developed from theory and were empirically tested using existing scales as well as self-developed scales. A questionnaire was developed via two subsequent pilot studies to

test the model adequately. Primary data was collected via a questionnaire and analysed quantitatively and independently.

The context of the study is meat substitutes as an innovation. This was chosen as a suitable innovation for the study as these substitutes are not widely accepted despite the numerous advantages they have for consumers' health, animal welfare as well as the planet (Lea et al., 2006). Within this context, consumers feel strongly about their dietary choices as they are largely personal and may offer insight into the differences between resistance and adoption.

3.2 Population and Sample

In quantitative research, having an adequate sample directly impacts the researcher's ability to draw conclusions with confidence. Sample sizes too small or that are not representative can lead to results that are biassed or misleading. However, large sample sizes can lead to amplified differences (Hair et al., 2018). The recommended size of the sample based on a 90 - 95 % confidence level is quoted to be between 230 - 370 respondents (Field, 2013). The aim of this study was to reach a number of respondents within said range.

In total, there were 306 questionnaire respondents, though not all respondents completed the questionnaire in its entirety. Among these 306 respondents, 37 respondents did not complete the questionnaire fully. The reason for this could be for example time constraint, distraction or general disinterest in the questionnaire. Since respondents were left to answer the questionnaire in their own time, some respondents may have intended to finish the questionnaire at a later time but did not get to do so before the questionnaire was closed and published on Qualtrics.

As a result, the survey had a total of 269 valid and complete responses. When evaluating the data, 4 observations were removed after careful consideration. Observations 1 and 2 were removed as they were responses recorded by the researchers before the survey went live to test the survey. Using casewise diagnostics, observations 209, 196 and 225 were suggested for deletion. However, only observations 209 and 196 were deleted as these two observations had scored the same on every question. Observation 225 scored the same on all questions related to adoption but had a different, though repeating, score for resistance. It was concluded that this was no sufficient reason to remove the observation.

The research focuses on the concepts of adoption and resistance within the context of Dutch consumers, therefore, the data was collected solely in the Netherlands. The questionnaire was administered in the Dutch language in order to be easily understood by Dutch respondents whose native language is Dutch. Since the original survey items are in English, accurate translations of each question were reverse engineered by native Dutch and English speakers. The translations were then checked by three different individuals to safeguard against any mistakes or inconsistencies.

Generalizability in quantitative research means that the findings obtained from the sample are representative of the population. In order for the sample to be relatively generalizable, the data was collected in three different Dutch cities of Eindhoven, Utrecht and Nijmegen. In addition, the data was collected by a group of five researchers in public places where a diverse group of people were found such as the central stations of each city. Data was collected over the course of two days, between the 25th and 26th of May, 2022.

The survey was designed using the software Qualtrics for effective response collection and analysis. The responses were collected physically via an online questionnaire administered with a QR code respondents' self-completion. Researchers were also equipped with a tablet in case the respondent was unable or unwilling to read the QR code. The benefit of administering the questionnaire physically is that the researcher was present in case the respondent had any questions. While the researchers attempted to approach a diverse range of people, a certain bias did exist since the majority of respondents were between the ages of 15-30 years old. This is also reflected in the occupational distribution of the sample with 62,3 % of respondents being students. The gender distribution was relatively even with 46,4 % male respondents and 51,7 % female respondents. The demographic distribution of the sample can be found in Appendix D. Each researcher approached the respondents in person and verbally asked them for permission to complete the questionnaire; however, the questionnaire also included a privacy and consent prompt, seen in Appendix B.

3.3 Research Ethics

The ethical considerations of this research revolve around data collection and analysis and sources. Firstly, the respondents will be presented with a written consent form to share their opinion and data. The consent form will make it clear that participation in the research is purely voluntary and that the respondent may stop the questionnaire at any point. The consent form also highlights that participation in the research is completely anonymous. Lastly, we will inform the respondent that the information will be used solely for this research and will be treated confidentially and personal information that could be used to identify them will not be shared. The respondent is also given the researchers' names and contact information in case the respondent is interested in receiving further information. With regards to the theoretical information collection, all sources will be cited and given credit for.

3.4 Pilot Studies

In total, two pilot studies were performed with each study evaluated quantitatively and qualitatively. The adjustments from the two pilot studies resulted in the final questionnaire.

3.4.1 Pilot I

The first pilot study was primarily to operationalise the constructs and select items that were representative of measurement. Most importantly, the two dependent variables, resistance and adoption needed to be largely adjusted in order to better reflect the three dimensional structure of the constructs. The other concern that was also highlighted by the qualitative evaluation was that there was a lack of consistency within the questions with some items referring to the situational prompt and others to the innovation itself. The goal was to adapt the survey so that there would be more consistency throughout. To avoid steering the respondent in a certain direction, the questionnaire used the term "meat substitutes" in place of "plant-based meat alternatives", as well as replaced the images that used the same marketing ploy. In order to significantly increase the internal consistency of the 'animal welfare' scale (α = ,620), item 4 was omitted resulting in a notable increase of the Cronbach's alpha (α = ,833). The internal consistency measures of the pilot studies can be found in Appendix F. In total the first pilot included 19 valid respondents predominantly between the ages of 15 - 30 years old.

3.4.2 Pilot II

The second pilot study was primarily qualitative in order to determine whether potential respondents understood the questions sufficiently. Each researcher selected individuals to provide feedback on the questionnaire and its clarity. The complexity of the language was also adjusted to suit the demographic sample. Academic terms were simplified and questions were made more straight forward to ensure clarity. The focus of this pilot was also largely on fine tuning the introduction and situation prompt, since this proved to be a source of confusion for many respondents. In addition, the pilot ensured consistency between the original items quoted from literature and their interpretation in the context of the innovation. The scale for the variable green perceived value was also adapted from a different source that fit the context of meat substitutes better (Gershoff & Frels, 2015). The original scales and items used in the final survey can be found in Appendix A.

3.5 Operationalisation

In order to operationalise the constructs used in this study, both existing and self-invented scales will be employed. The original items have been adapted to the context of this study which are meat substitutes. Measurement items for resistance and adoption have been self-invented based on theoretical conceptualisations of the constructs' three-dimensional structure.

Table 4. Examples of questionnaire items

Construct	Definition	Adapted items	Source
Perceived voluntariness	The degree to which the choice one makes is under the individual's volitional control (Plouffe, 2011)	Consumption of meat alternatives is voluntary	Plouffe, (2001)
Perceived unnaturalness	Perceived unnaturalness is the degree to which the innovation is perceived to contain additional elements that could be toxic, artificial, synthetic, and contrary to nature. (*Roman et al., 2017)*	Meat alternatives contain additives	Steptoe et al., (1995)
Perceived greenness	The degree to which consumers' evaluate green products based on their environmental desires, sustainability expectations, and green needs (Chen & Chang, 2012).	Purchasing meat alternatives is a good environmental choice	Gershoff & Frels, (2015)
Animal welfare	The degree to which the choice one makes is supporting animal protection and better animal treatment (de Jonge & van Trijp, 2013).	By eating meat alternatives, I respect the quality of life of animals	Marcus et al., (2022)
Perceived healthiness	Being perceived as high in nutrients, good for your body and globally healthy, in line with current dietary guidelines (Steptoe et al., 1995).	Meat alternatives keep me healthy	Steptoe, Pollard, & Wardle, (1995).

Innovation adoption	An attitude, consisting of **affect, cognition** and **behaviour**, that causes consumers to adopt or reject an innovation (Breckler, 1984).	**Cognitive:** I think meat alternatives are a good thing **Behaviour:** I intend to eat meat alternatives **Affect:** Thinking about meat alternatives makes me feel glad.	Self-invented on the basis of Breckler, (1984)
Innovation resistance	A negative attitude, consisting of **affect, cognition** and **behaviour** that causes consumers to resist an innovation (Breckler, 1984).	**Affect**: I feel angry about the consumption of meat alternatives **Cognitive**: I don't think that the consumption of meat alternatives is a good idea **Behaviour**: I will file a complaint against the consumption of meat alternatives	Self-invented on the basis of Breckler, (1984)
Perceived innovativeness	The degree to which an individual is relatively earlier in adopting an innovation than other members of his system (Rogers & Shoemaker, 1971).	I must see other people using innovations before I consider them.	Hurt, Joseph & Cook, (1977)

3.6 Construct reliability and validity

Reliability analysis was conducted in order to evaluate the internal consistency of the four constructs. Internal consistency is measured by Cronbach's alpha, and the accepted threshold is 0,6 at the least (Field, 2013). If a construct measures below a Cronbach's alpha of 0,6 it indicates that the scale items are not reliable as they do not have high internal consistency. All items have a Cronbach's alpha above the 0,6 threshold, except for innovativeness (α = ,181).

In order to increase the internal consistency of the innovativeness scale, item 1 was deleted. Caution should be taken when deleting items however, the item had very low communality (=,390) and this resulted in a significant increase in the Cronbach's alpha (α = ,640). Conceptually, item 1 of the innovativeness scale differed from the other two items which measured the receptiveness of the individual to new ideas. In contrast, item 1 measured the individual's hesitation towards new ideas and might have caused confusion among respondents. Previous pilots have also experimented with reversing the item (α = ,450), however only deletion proved to be effective.

Most importantly, both adoption and resistance measures had excellent internal consistency measures with a Cronbach's alpha of ,958 and ,922 respectively. This was crucial since both scales were self developed to reflect the three-dimensional nature of the constructs. This concludes that the items for both resistance and adoption measure the construct they are intended to measure.

Table 5. Internal consistency of constructs based on Cronbach's alpha measurement

Construct	Original # items	Cronbach's alpha	# of items deleted	Cronbach's alpha	Percentage explained variance
Voluntariness	3	,606			59,257 %
Unnaturalness	3	,668			61,447 %
Greenness	3	,775			69,965 %
Animal	3	,848			76,794 %
Health	3	,836			75,743 %
Innovativeness	2	,181	1	,640	73,570 %
Adoption	9	,958			75,000 %
Resistance	9	,922			74,543 %

In order to measure the convergent and discriminant validity of the construct before hypothesis testing, a factor analysis was performed. Convergent validity ensures that the items are related to one another. This can be measured by performing a factor analysis on each construct to measure the percentage explained variance (>50%) and thus the unidimensionality of a construct. In order to perform a factor analysis, the conditions of need to be met, namely the construct has to score at least 0,50 on the Kaiser–Meyer–Olkin (KMO) and Bartlett's test needs to be significant (Hair et al., 2018). For all the constructs these conditions were met, which can be seen in Appendix E. As seen in both the Table 5 the percentage explained variance is greater than 50 % in the factor analysis on all constructs.

An interesting finding from the factor analysis can be concluded that resistance loads on two components. Throughout the study, both resistance and adoption are defined as attitudes composed of three dimensions: behavioural, cognitive and affective (Berckler, 1984). While the factor analysis (seen in Appendix E) of adoption shows that items reflecting behavioural, cognitive and affective dimensions all load on one component, the factor analysis of resistance shows different results. As seen in Appendix E items measuring resistance load on two

components, with cognitive and affective resistance forming one factor and behavioural resistance forming the other.

Lastly, the discriminant validity of the constructs was measured. Discriminant validity indicates whether theoretically unrelated constructs are actually unrelated. Since performing a factor analysis with all the constructs simultaneously resulted in too much overlap, the dependent and independent variables were measured separately. The results, shown in Appendix E, show that green perceived value and perceived animal welfare have low discriminant validity as both load on the same factor. All items in both constructs had sufficient communalities and did not load on multiple factors. Different rotations were applied but all resulted in the two constructs loading on factor one. One reason for this could be that while green perceived value and animal welfare are conceptually different constructs, in the context of food innovations especially meat substitutes, they are closely related in the mind of the consumer.

4. Results

In the following chapter, the analysis required for hypothesis testing will be presented. Firstly, descriptive statistics will provide a better understanding of the respondent demographics. The data will be tested for assumptions to ensure that a multiple regression is a suitable statistical method for analysis. Following this, the hypotheses (H1-H6) will be tested using a multiple regression. Lastly, the results will be presented and any additional analysis will be performed.

4.1 Descriptive Statistics

The table below presents the descriptive statistics for each construct, excluding the control variables. Firstly, the Pearson correlations are listed as well as the mean and standard deviation of each construct. Looking at the Pearson correlations, the relationships between each construct can be examined. Interestingly, voluntariness is not correlated with any of the other constructs. Furthermore, resistance was negatively correlated with adoption - .756, $p =< .01$ as well as the antecedents of adoption. The correlation between resistance and adoption exceeds the 0,7 benchmark and could indicate multicollinearity. Before performing the multiple regression, the sample will be tested further to rule out multicollinearity in the data. Adoption was negatively

correlated with the antecedent of resistance, unnaturalness -.467, p =<0.1; while positively correlated with its own antecedents. Overall, this indicates that the more resistance was present, the less likely that adoption would occur.

Within the means and standard deviation there was not much variation. However, a notable finding is that the mean of the variable health was relatively low, 3.834, indicating that respondents on average disagreed with the statements that meat substitutes are beneficial for their health. This may signal a change in the public's perception of meat substitutes as "healthier" but rather an association with highly processed meat substitute innovations. The mean of resistance, 2.551, is also relatively low signalling that meat substitutes evoked more adoption than resistance.

Table 6. Correlation Matrix

	1	2	3	4	5	6	7
1 Adoption							
2 Resistance	-.756**						
3 Voluntariness	-.021	-.061					
4 Unnaturalness	-.467**	.445**	.039				
5 Greenness	.621**	-.540**	.006	-.366**			
6 Animal Welfare	.547**	-.499**	-.011	-.250**	.570**		
7 Health	.646**	-.430**	-.013	-.431**	.539**	.425**	
Mean	4.346	2.551	5.624	4.426	4.860	5.064	3.834
Standard Deviation	1.476	1.239	1.101	1.149	1.256	1.466	1.208
N = 265; p =< .01**							

As a result, the multiple regression equations for the following study are:

$$RES = \beta_0 - \beta_1 VO + \beta_2 UN + \beta_3 HE + \beta_4 GR + \beta_5 AN$$

$$AB = \beta_0 + \beta_1 VO + \beta_2 UN + \beta_3 HE + \beta_4 GR + \beta_5 AN$$

Where:

RES - Resistance

AB – Adoption

VO – Perceived voluntariness

UN – Perceived unnaturalness

HE– Perceived healthiness

GR – Perceived green value

AN – Animal welfare

In the following table, the demographic characteristics of the sample descriptive statistics for the control variables are presented.

4.2 Assumption testing

In order to test the hypotheses or the influence of several antecedents on resistance and adoption, a multiple linear regression is conducted. However, to correctly perform a multiple regression several assumptions must first be met.

4.2.1 Assumption I

The first assumption of a multiple linear regression is that both the independent and dependent variables must be measured on an interval or ratio level (Field, 2013). All constructs in this study are measured according to a 7-point Likert scale, which in the social sciences is generally accepted as an interval scale (Wu & Leung, 2017). In addition, the control variables are measured on an interval ratio. This first assumption of the multiple regression is therefore met.

4.2.2 Assumption II

The second assumption that needs to be met is that the residual errors are approximately normally distributed (Field, 2013). Each variable included in the multiple regression should have a normal distribution in order to use multiple regression as a parametric technique. The normality of data can be either tested using skewness and kurtosis, or visualised using P-P plots or histograms. As seen in Appendix G, shows that the skewness and kurtosis values are in the acceptable range of -3 and +3, with the exception of the variable ‘occupation’ with a kurtosis

value of 3,525 (Hair et al., 2018). However, looking at the P-P plot in Appendix G, it is shown that this is not a large deviation, so the assumption is still met.

4.2.3 Assumption III

When performing a multiple regression, there must be independence of observations. Whether the residuals are independent, can be checked using the Durbin Watson statistic, as seen in Appendix H. The Durbin Watson statistic ranges between 1 and 4, and in order to assume independence of observations the value should be around 2. Looking at the regression output in Appendix H, the Durbin Watson value ranges between 1,890 and 2,067. These values indicate that there is no autocorrelation detected in the sample (Hair et al., 2018; Field, 2013).

4.2.4 Assumption IV

The fourth assumption calls for homoscedasticity in the data. Homoscedasticity indicates that the variances lay along the line of best fit in a residual plot and that there are no biases present in the data. Looking at the residual scatter plots resulting from the regression analysis (see Appendix G), they are widespread and free of bias (Field, 2013). It can thus be said that the assumption of homoscedasticity is met.

4.2.5 Assumption V

Lastly, in order to perform a multiple regression there must be a linear relationship between the independent variables and the dependent variable. The best way to check for linearity in data is to take a look at partial regression plots, such as the ones shown in Appendix G (Hair et al., 2018). From these plots it can be seen that the relationships between the independent variables and the dependent variables are linear, thus meeting the last assumption of multiple regression.

Since all the assumptions have been met, in the following section the hypothesis testing will take place. Firstly, a multiple regression analysis will be performed using adoption and resistance as a dependent variable. Secondly, the relationship between adoption and resistance will be explored. Lastly, any additional analysis will be performed.

4.3 Multiple regression analysis

The results of the multiple regression for dependent variables adoption and resistance can be found in tables 7 and 8 respectively. A stepwise approach was taken in order to first test the model including only the control variables, then the antecedents and finally the complete model including both control variables and antecedents. As indicated by the R2 and the adjusted R2, the model increased in explanatory power when accounting for all antecedents and control variables for both dependent variables: adoption (R2 = ,841, Adjusted R2 = ,689) and resistance (R2 = ,754, Adjusted R2 = ,541). The adjusted R2 denotes the percentage of variance that is explained by the model while taking into account the complexity of the model. Both models show sufficient explanatory power and are statistically significance with the adoption regression (R2 = ,841, F(16, 248) = 37,472, p = <,001) and the resistance regression (R2 = ,754, F(16, 248) = 20,416, p = <,001). The full ANOVA results of both regression can be found in Appendix H.

The regression coefficients displayed in tables 7 and 8, indicate the relationship between the said independent variable and the dependent variable. Looking at the regression with adoption being the dependent variable, it can be seen that all of the hypothesised adoption antecedents have a positive and significant relationship with adoption. The results found in table 7, model 3, show that perceived healthiness (*H1a*) of meat substitutes has the strongest positive relationship (β = ,309, p = < ,001) with the adoption of meat substitutes, followed by perceived green value (*H2a*) (β = ,291, p = < ,001) and lastly animal welfare (*H3a*) (β = ,115, p = ,011). This is in support of hypotheses H1a, H2a and H3a .

With regards to the hypothesised resistance antecedents, the results are divergent. In line with hypothesis *H4b*, the perceived voluntariness is not a significant predictor of adoption (β = -,019, p = ,686). The other antecedent of resistance however, perceived unnaturalness has a negative and significant relationship with adoption (β = -,177, p = <,001). This result is not in support of hypothesis *H5b*.

Taking a further look at the control variables in the adoption regression, the relationships between gender, innovativeness and meat consumption can be analysed. The demographic results show that meat substitutes are more likely to be adopted by women (β = ,279, p = ,013) than

men, and that age has no influence on adoption. Furthermore, an individual's innovativeness has a positive effect on adoption (β = ,303, *p* = <,001) whereas meat consumption has a negative and significant effect on the adoption of meat substitutes (β = -,178, *p* = <,001).

Table 7. Multiple linear regression output - Coefficients and significance (DV: Adoption)

	Model								
	1			2			3		
	β	*SE*	*p*	*β*	*SE*	*p*	*β*	*SE*	*p*
Voluntariness				-,011	,545	,836	-,019	,047	,686
Unnaturalness				-,222	-,058	<,001	-,177	,051	<,001
Greenness				,291	,064	<,001	,291	,055	<,001
Animal Welfare				,216	,050	<,001	,115	,045	,011
Healthiness				,423	,062	<,001	,309	,057	<,001
Innovativeness	,475	,076	<,001				,303	,057	<,001
Meat Consumption	-,321	-,038	<,001				-,178	,030	<,001
Female	,351	,149	,019				,279	,111	,013
Gender neutral	1,089	,579	,061				,515	,426	,228
Working	,048	,197	,808				,256	,145	,079
Retired	,087	,957	,928				,097	,703	,890
30-45 years old	,238	,286	.406				-,095	,212	,654
45-60 years old	-,299	,290	,304				-,384	,213	,072
60+ years old	-,064	,502	-,899				-,208	,372	,576
(Constant)	2,911	,487	<,001	1,257	,545	,022	,968	,605	,111
R^2	,660	(,411)		,759	(,569)		,841	(,689)	

(Adjusted R^2)	

N = 265, p <.05, Reference categories: Male; Student; 15-30 years old

The same approach was used for the multiple linear regression using resistance as a dependent variable. The results shown in Table 8, indicate that within the antecedents of resistance only perceived unnaturalness has a positive and significant effect (β = ,227, *p* = < ,001). THe other antecedent of resistance, perceived voluntariness, is insignificant. These results show support for the hypothesis *H5a* and but not for *H4a*.

Moving onto the antecedents of adoption, the results are also opposing. Both green perceived value (β = -,258, *p* = < ,001) and animal welfare (β = -,126 *p* = ,007) significantly predict resistance of meat substitutes. The last adoption antecedent however, has a weak and insignificant relationship in support of the *H1b* hypothesis.

Lastly, the control variables in the resistance regression show opposing relationships to those see in the adoption regression. Thus, there is a moderate negative significant relationship between women and resistance (β = -,471 *p* = ,007) as well as with innovativeness and resistance (β = -,267, *p* = <,001). Higher weekly meat consumption has a positive and significant relationship (β = ,103, *p* = <,001) with resistance of meat substitutes. Lastly, occupation has become significant in the resistance model as working individuals (β = -,355, *p* = ,017), are less likely to resist meat substitutes than students.

Table 8. Multiple linear regression output - Coefficients and significance (DV: Resistance)

	Model								
	1			2			3		
	β	*SE*	*p*	*β*	*SE*	*p*	*β*	*SE*	*p*
Voluntariness				-,083	,053	,121	-,088	,048	,068
Unnaturalness				,278	,058	<,001	,227	,052	<,001
Greenness				-,257	,063	<,001	-,258	,056	<,001
Animal Welfare				-,218	,049	<,001	-,126	,046	,007
Healthiness				-,071	,061	,245	-,004	,058	,946
Innovativeness							-,267	,058	<,001
Meat Consumption	,191	0,34	<,001				,103	,030	<,001
Female	-,589	,133	<,001				-,471	,113	<,001
Gender neutral	-,727	,516	,160				-,265	,434	,543
Working	-,299	,175	,089				-,355	,148	,017
Retired	,395	,852	,643				,254	,717	,723
30-45 years old	-,072	,255	,778				-,003	,216	,990
45-60 years old	,326	,258	,207				,286	,217	,189
60+ years old	,099	,447	,825				,130	,379	,189
(Constant)	4,090	,434	<,001	4,411	,536	<,001	5,296	,617	<,001
R^2 (Adjusted R^2)	,604	(,365)		,647	(,418)		.754	(,541)	

N = 265, p <.05, Reference categories: Male; Student; 15-30 years old

Finally, in order to measure the relationship between adoption and resistance, a Pearson correlation was computed. The results of the Pearson correlation can be found in Table 9. As shown in the table, adoption and resistance have a strong negative and significant relationship (β = -,756, p = <,001). This is contrary to the *H6* hypothesis which states that the two constructs have a weak to no relationship. Therefore, the results do not support the hypothesis.

Table 9. Pearson Correlations - Adoption and Resistance

		Adoption	Resistance
Adoption	Pearson correlation	1	-,756**
	Sig. (2-tailed)		<,001
	N	265	265
Resistance	Pearson correlation	-,756**	1
	Sig. (2-tailed)	<,001	
	N	265	265

4.4 Additional Analysis

The factor analysis previously performed in Chapter 3, revealed that resistance loads on two factors. As seen in Appendix E, the cognitive and affective components of resistance load on factor 1, while the behavioural component of resistance loads of factor 2. In addition, factor 1 which includes the affective and cognitive component accounts for 62,325 % of the total variance. These findings provide an interesting avenue for further analysis. In the following section, the multiple linear regression will be again performed to test the hypotheses with the two dimensions of resistance separately.

The results of the regression can be found in Table 10, with the results with the dependent variable being cognitive-affective resistance presented in Model 1 and behavioural resistance in Model 2. Both models show sufficient explanatory power and are statistically significance with the cognitive-affective resistance regression (R2 = ,792, F(16, 248) = 21,410, p = <,001) and the

behavioural resistance regression (R2 = ,593, F(16, 248) = 8,417, p = <,001). The full ANOVA results of both regression can be found in Appendix H.

Looking at the coefficient output of the regressions, the cognitive-affective regression does not show results much different than the regression seen in Table 8. With regards to the hypotheses *H1a-H5b* the results are comparable. However, in Model 2 presenting behavioural resistance the relationships between some variables changed. Firstly, perceived voluntariness is shown to have a negative and significant relationship with resistance (β = -,159, p = ,009. This finding partially supports the *H4a* hypothesis, since the dependent variable is behavioural resistance. Secondly, the adoption antecedent, animal welfare, has an insignificant relationship with behavioural resistance as hypothesised in *H3b*. Lastly, the control variable of meat consumption has an insignificant effect on behavioural resistance, contrary to previous findings.

Table 10. Multiple linear regression output - Coefficients and significance (DV's: Cognitive-Affective Resistance and Behavioural Resistance)

Dependent Variable:	1 Cognitive-Affective Resistance			2 Behavioural Resistance		
	β	*SE*	*p*	*β*	*SE*	*p*
Voluntariness	-,052	,052	,318	-,159	,060	,009
Unnaturalness	,243	,056	<,001	,196	,065	,003
Greenness	-,264	,061	<,001	-,248	,071	<,001
Animal Welfare	-,141	,050	,006	-,097	,058	,098
Healthiness	-,026	,064	.688	,039	,074	,594
Innovativeness	-,308	,063	<,001	-,185	,073	,012
Meat Consumption	,137	,033	<,001	,034	,038	,375
Female	-,494	,124	<,001	-,425	,143	,003
Gender neutral	-,445	,474	.349	,096	,548	,862
Working	-,283	,162	,082	-,499	,187	,008
Retired	,172	,783	,826	,417	,904	,645
30-45 years old	-,067	,236	,778	,125	,273	,647
45-60 years old	,455	,237	,056	-,053	,274	,847
60+ years old	,169	,414	,683	,052	,478	,914
(Constant)	5,570	,674	<,001	4,748	,779	<,001
R^2 (Adjusted R^2)	,762	(,553)		,593	(,310)	
N = 265, p <.05, Reference categories: Male; Student; 15-30 years old						

Furthermore, the relationship between adoption and the two dimensions of resistance was computed using Pearson correlations. These results are in line with the previous findings for *H6*. Both the cognitive-affective and behavioural resistance have negative and significant relationships with adoption as seen in Table 11. The coefficient of behavioural adoption however is weaker than that of cognitive-affective resistance (-,489**< -,796**).

Table 11. Pearson Correlations - Adoption and Two-Dimensions of Resistance

		Adoption	Cognitive-Affective Resistance	Behavioural Resistance
Adoption	Pearson correlation	1	-,796**	-,489**
	Sig. (2-tailed)		<,001	<,001
	N	265	265	265

5. Conclusion and Discussion

5.1 Conclusion

The following study was centred around the distinction between resistance and adoption with the research question being: *How do perceived innovation characteristics of meat substitutes affect adoption and resistance, and are the two constructs qualitatively different?*. In order to test the research question, a series of six hypotheses were generated to investigate the relationships between adoption and resistance antecedents and the constructs of adoption and resistance. The final results can be found in Table 11. As shown in the table, the adoption antecedent perceived healthiness of meat alternatives had a positive effect on adoption while having no effect on resistance. Therefore, both hypotheses, *H1a* and *H1b*, were supported. The other two adoption antecedents, green perceived value and animal welfare had a positive influence on adoption (supporting *H2a* and *H3a* respectively) but also had a negative relationship with resistance, thus rejecting hypotheses *H2b* and *H3b*.

The resistance antecedents had opposing results. The perceived voluntariness to buy meat substitutes had no relationship with either resistance or adoption, thus rejecting *H4a* and

supporting *H4b*. Meanwhile, perceived unnaturalness of the meat substitutes had a positive influence on the consumer's resistance to the innovation and but also a negative influence on the adoption, thus supporting *H5a* and rejecting *H5b*. Lastly, there was a negative relationship between adoption and resistance, thus the *Hb* hypothesis was not supported.

Table 11. Overview of the results

Hypotheses		Conclusion
H1a	Perceived healthiness has a positive influence on the adoption of meat substitutes.	Accepted
H1b	Perceived healthiness has a weak to no influence on the resistance of meat substitutes	Accepted
H2a	Green perceived value has a positive influence on the adoption of meat substitutes.	Accepted
H2b	Green perceived value has a weak to no influence on the resistance of meat substitutes.	Rejected
H3a	Animal welfare has a positive influence on the adoption of meat substitutes.	Accepted
H3b	Animal welfare has a weak to no influence on the resistance of meat substitutes.	Rejected
H4a	Perceived voluntariness has a negative influence on the resistance of meat substitutes.	Rejected
H4b	Perceived voluntariness has a weak or no influence on the adoption of meat substitutes.	Accepted
H5a	Perceived unnaturalness has a positive influence on the resistance of meat substitutes	Accepted
H5b	Perceived unnaturalness has a weak to no influence on the adoption of meat substitutes.	Rejected
H6	There is a weak or no relationship between adoption and resistance.	Rejected

5.2 Discussion

5.2.1 Theoretical implications

The focus of this study was on further exploring the distinction between innovation resistance and adoption. The research design investigated this via the relationships between perceived characteristics of meat substitutes and adoption and resistance. The underlying theory behind the research was that the constructs, innovation adoption and resistance, are not opposites and their relationship is not symmetrical or linear (Patsiotis et al., 2013). The central idea of this approach was that, if adoption and resistance were different, then the constructs would not share the same antecedents. The outcomes of the study are mixed, with six out of the eleven hypotheses supported.

Out of the six hypotheses that are supported however, all but two (*H1b* and *H4b*), indicate that the constructs of innovation adoption and resistance are in fact opposites of each other. Both perceived green value and animal welfare had a positive effect on adoption but also a negative influence on resistance. These findings suggest that consumers who view meat substitutes to not be as environmentally friendly, due to i.e. the high soy content, are also likely to actively resist them. The opposite is true for consumers who view meat substitutes to be more green, i.e. due to the high CO2 emissions of meat production, and are more likely to incorporate them into their diet. While the hypothesis that perceived voluntariness has no effect on adoption is supported, voluntariness is not found to be a predictor for resistance either thus, the finding does not rule out the constructs to be opposite. Only the perceived healthiness of meat substitutes is a predictor for adoption but not for resistance. Health motivation has also been quoted in other studies to be a significant variable in the context of food innovations (Siegrist & Sütterlin, 2017). Lastly, adoption and resistance are negatively correlated suggesting that the two constructs are in fact linearly related.

The additional analysis however, revealed findings slightly contrary to the regular regression. When behavioural resistance was isolated and analysed separately (as seen in Table10), its relationship with perceived voluntariness became significant (β = -,159, p = ,009) and the effect of animal welfare became insignificant (β = -,097, p = ,098). In addition, while the relationship of behavioural resistance with adoption was still negative and significant (see Table 11), the

effect was lesser than that of resistance (see Table 9). While previous research has explored the cognitive and affective components of resistance, the findings in this study signify that it is actually behavioural resistance that is more distinct from non-adoption (Castro et al., 2019).

The study contributes to the current body of resistance literature by cross testing the perceived innovation characteristics with adoption in order to conclude that in the case of meat substitutes, the two constructs share the majority of their antecedents with the exception of perceived healthiness. In addition, the study expands the usual conceptualisation of resistance to include a three-dimensional model for attitude (Breckler, 1984).

5.2.2 Managerial implications

For business practice, within the industry of meat substitutes or green innovations, a key takeaway from this study are the adoption antecedents. From the results, the key perceived product characteristics are healthiness followed by perceived green value and lastly animal welfare. Therefore, when launching a new food product, the main focus should be on highlighting the health benefits that the mean alternative brings, within the country's regulations. Marketing managers and professionals launching a new food product or meat substitute, should appeal to the consumer by first and foremost focusing the campaign on the added health benefits of the food and secondly on the decreased environmental impact of the innovation.

Unlike other studies, this research paper also investigated the resistance factors in the context of meat substitutes. The results indicate that from resistance antecedents, perceived unnaturalness had the highest impact. Therefore, the take away for managers when launching a novel food product is to avoid creating associations between the food product and new technologies or 'laboratory techniques'. Rather, the campaign should focus primarily on the natural and organic aspects of the innovation in order to prevent the consumer from resisting the product.

5.3 Limitations and further research

While close attention was paid to the research design, there are limitations to the study. Firstly, the data sample is limited to the Dutch market. Measuring adoption and resistance behaviour in other countries may result in different findings. For example, meat substitutes may be more or

less widespread and accepted by the general public in other countries than in the Netherlands (Tziva et al., 2020). There may also exist cultural differences in attitudes towards eating meat, since in some countries eating meat substitutes such as tofu or tempeh has been part of the tradition for centuries. Therefore, it is important to take these differences into account when drawing conclusions from the results based solely on the Dutch market.

The second limitation of the research is that the adoption and resistance factors are highly specific to the innovation being studied. This makes the research difficult to replicate with another innovation other than certain food innovations. The limitation of the context may have also had an impact on the results since the results may have differed in a different context. For example, a more controversial innovation may have triggered more differentiated reactions among the respondents.

Finally, this study explored adoption and resistance from the perspective of Breckler's (1984) tripartite model for attitude. An interesting avenue for future research would be to repeat the research design using various conceptualisations of adoption and resistance, since findings show that the behavioural component of resistance changes the results. Since there are many different conceptualisations of resistance, this was beyond the scope of this study. However, it could shed light on different insights relating to the distinction between innovation adoption and resistance.

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6. Appendices

Appendix A - Original scales and items of constructs

Dimensions	**Original Items**	**Source**
Perceived voluntariness	My use of an Exact card is voluntary. Although suggested to my business, using the Exact card system was not compulsory. My superiors expect me to use a PWS .	Plouffe, 2001 Plouffe, 2001 Moore & Benbasat, 1991
Perceived unnaturalness	Eating human-made meat is an unnatural practice that separates us further from nature. Contains no additives Contains no artificial ingredients	Hwang et al., 2020 Steptoe et al., 1995 Steptoe et al., 1995
Green perceived value	This mattress deserves to be labelled environmentally friendly Purchasing this mattress is a good environmental choice A person who cares about the environment would be likely to buy this mattress.	Gershoff & Frels, 2015
Animal welfare	In general, humans have too little respect for the quality of life of animals Do you believe that farm animals can feel pain and suffering? I choose food which has been produced in a way that minimises cruelty to animals	Marcus et al., 2022 Estevéz-Moreno et al., 2021 Clonan et al., 2015
Perceived healthiness	Keeps me healthy. Enriched processed meat is likely to have a beneficial impact on my health. Enriched processed meat is healthier than conventional products.	Steptoe et al., 1995 Shan et al., 2017 Shan et al., 2017
Innovativeness	I must see other people using new innovations before I consider them. I enjoy trying out new ideas. I am receptive to new ideas.	Hurt et al., 1997

Appendix B - Final Survey

Beste deelnemer,

Ja, u helpt ons met afstuderen! Onwijs bedankt voor uw tijd en hulp met ons onderzoek.

Wij zijn masterstudenten aan de Radboud Universiteit in Nijmegen. In dit onderzoek zijn we benieuwd naar uw mening over vleesvervangers. Als u een samenvatting van dit onderzoek wilt of als u vragen heeft, laat het ons dan weten.

Deelname is geheel vrijwillig. U heeft het recht om uw deelname aan het onderzoek te beëindigen en uzelf terug te trekken wanneer de deelname al is begonnen, zonder negatieve gevolgen en zonder reden. Zie voor meer informatie https://www.ru.nl/privacy/. De verzamelde informatie wordt gebruikt voor educatieve doeleinden en moet twee jaar worden bewaard. Hierna wordt deze informatie vernietigd.

Met vriendelijke groeten,

Jelita Rumengan, Joost Langhout, Natalia Cervantes, Sven Kuijsten en Amy van Nijnatten

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- **Bij deelname aan dit onderzoek accepteer ik dat mijn informatie wordt gebruikt voor academische doeleinden.**

Voor het beantwoorden van de volgende vragen, lees onderstaande situatie:

Stel dat het cafe/restaurant van jouw werkgever of school alle vleesproducten door vleesvervangers vervangt. Met vleesvervangers worden producten bedoeld die proberen de structuur en de smaak van vleesproducten te imiteren, zonder het gebruik van vlees (zie voorbeelden hieronder).

1. *7-points Likert scale (Volledig oneens - Volledig mee eens)*
    a. Het eten van vleesvervangers is vrijwillig.
    b. Het eten van vleesvervangers is zeker niet verplicht.
    c. Er wordt van mij verwacht dat ik vleesvervangers eet.
2.
    a. Vleesvervangers zijn bewerkt waardoor de echtheid van het product verloren gaat.
    b. Vleesvervangers bevatten smaakversterkers en andere toevoegingen.
    c. Vleesvervangers bevatten kunstmatige ingrediënten.
3.
    a. Vleesvervangers verdienen het om gelabeld te worden als ‘milieuvriendelijk’.
    b. Het kopen van vleesvervangers is een milieuvriendelijke keuze.
    c. Een persoon die geeft om het milieu zou waarschijnlijk vleesvervangers kopen.
4.
    a. Door het eten van vleesvervangers respecteer ik de kwaliteit van leven van dieren.
    b. Door het eten van vleesvervangers lijden dieren minder.
    c. Door het eten van vleesvervangers draag ik minder bij aan dierenleed.
5.
    a. Vleesvervangers houden mij gezond.
    b. Vleesvervangers hebben waarschijnlijk een voordelige impact op mijn gezondheid.
    c. Vleesvervangers zijn gezonder dan vlees.
6.
    a. Ik denk dat de vervanging van vlees door vleesvervangers iets goeds is.
    b. De vervanging van vlees door vleesvervangers komt overeen met mijn overtuigingen.
    c. Ik heb een positieve mening over de vervanging van vlees door vleesvervangers.
    d. Ik ben van plan om vleesvervangers te eten.
    e. Ik heb de intentie om vleesvervangers te proberen.
    f. Waar mogelijk zal ik de vervanging van vlees door vleesvervangers actief ondersteunen.
    g. Ik verheug mij als ik denk aan de vervanging van vlees door vleesvervangers.
    h. Het denken over de vervanging van vlees door vleesvervangers maakt me blij.
    i. Het denken over de vervanging van vlees door vleesvervangers stemt me tevreden.
7.
    a. Ik word boos als ik denk aan de vervanging van vlees door vleesvervangers.

b. Ik voel negatieve emoties als ik denk aan de vervanging van vlees door vleesvervangers.
c. Ik vrees de vervanging van vlees door vleesvervangers.
d. Ik denk niet dat de vervanging van vlees door vleesvervangers een goed idee is.
e. De vervanging van vlees door vleesvervangers is totaal niet in lijn met mijn overtuigingen.
f. Ik heb sterke negatieve vooroordelen over vleesvervangers.
g. Ik ga een klacht indienen tegen de vervanging van vlees door vleesvervangers.
h. Indien mogelijk zal ik de vervanging van vlees door vleesvervangers proberen tegen te houden.
i. Ik ben geneigd om te protesteren tegen de vervanging van vlees door vleesvervangers.

8. Wat is uw geslacht?
    a. *Man*
    b. *Vrouw*
    c. *Gender neutraal*
    d. *Anders*
9. Wat is momenteel voor u van toepassing?
    a. *Student*
    b. *Werkende*
    c. *Gepensioneerd*
    d. *Anders*
10. In welke leeftijdscategorie bevindt u zich?
    a. *15-30*
    b. *30-45*
    c. *45-60*
    d. *60+*
11. *7-points Likert scale (Volledig oneens - Volledig mee eens)*
    a. Ik moet andere mensen een innovatie zien gebruiken voordat ik ze overweeg.
    b. Ik vind het leuk om innovaties uit te proberen.
    c. Ik ben welwillend tegenover innovaties
12. Hoeveel dagen per week eet u vlees?
    a. *0-7 dag per week*
13. In welke stad bent u momenteel?
    a. *Nijmegen*
    b. *Eindhoven*
    c. *Utrecht*

Final Survey - Consent Form (English)

Dear participant,

Yes, you can help us graduate! Thank you so much for your time and help with our research.

We are Master's students at Radboud University in Nijmegen. In this survey we would like to hear your opinion about meat substitutes. If you would like a summary of this research or if you have any questions, please let us know.

Participation is completely voluntary. You have the right to terminate your participation in the study and to withdraw yourself once the participation has already begun, without negative consequences and without providing a reason. For more information, see https://www.ru.nl/privacy/. The information collected is used for educational purposes and must be kept for two years. After this, this information will be destroyed.

Kind regards,

Jelita Rumengan, Joost Langhout, Natalia Cervantes, Sven Kuijsten and Amy van Nijnatten

Contact:
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email_address@ru.nl
+31-000000

- **By participating in this study, I accept that my information will be used for academic purposes.**

Prompt:
Imagine your workplace/school cafeteria replaces all meat assortment into meat alternatives. With meat alternatives we mean products that closely resemble the texture and taste of meat, but are not made of meat. Please answer the following statements.

Appendix C - Operationalisation of constructs

Construct	**Definition**	**English Items**	**Dutch Items**	**SPSS code**
Perceived voluntariness	The degree to which the choice one makes is under the individual's volitional control (Plouffe, 2011)	Consumption of meat alternatives is voluntary Consumption of meat alternatives is not compulsory It is expected that I eat meat alternatives	Het eten van vleesvervangers is vrijwillig Het eten van vleesvervangers is zeker niet verplicht Er wordt van mij verwacht dat ik vleesvervangers eet	Volunt_1 Volunt_2 Volunt_3

Perceived unnaturalness	The degree to which the innovation is perceived to contain additional elements that could be toxic, artificial, synthetic, and contrary to nature. (*Roman et al., 2017)*	Meat alternatives are processed, which causes authenticity loss of the product Meat alternatives contain additives Meat alternatives contain artificial ingredients	Vleesvervangers zijn bewerkt waardoor de echtheid van het product verloren gaat Vleesvervangers bevatten smaakversterkers en andere toevoegingen Vleesvervangers bevatten kunstmatige ingrediënten	Unnatur_1 Unnatur_2 Unnatur_3
Green perceived value	The degree to which consumers' evaluate green products based on their environmental desires, sustainability expectations, and green needs *(Chen & Chang, 2012)*	Meat alternatives deserve to be labelled environmentally friendly Purchasing meat alternatives is a good environmental choice A person who cares about the environment would be likely to buy meat alternatives	Vleesvervangers verdienen het om gelabeld te worden als 'milieuvriendelijk' Het kopen van vleesvervangers is een milieuvriendelijke keuze Een persoon die geeft om het milieu zou waarschijnlijk vleesvervangers kopen	Envir_1 Envir_2 Envir_3
Animal welfare	The degree to which the choice one makes is supporting animal protection and better animal treatment. *(de Jonge & van Trijp, 2013)*	By eating meat alternatives, I respect the quality of life of animals Meat alternatives reduce animal threat By eating meat alternatives, I contribute less to animal cruelty	Door het eten van vleesvervangers respecteer ik de kwaliteit van leven van dieren Door het eten van vleesvervangers lijden dieren minder Door het eten van vleesvervangers draag ik minder bij aan dierenleed	Anim_1 Anim_2 Anim_3

Perceived healthiness	Being perceived as high in nutrients, good for your body and globally healthy, in line with current dietary guidelines. (*Steptoe et al., 1995)*	Meat alternatives keep me healthy Meat alternatives are likely to have a beneficial impact on my health Meat alternatives are healthier than meat	Vleesvervangers houden mij gezond Vleesvervangers hebben waarschijnlijk een voordelige impact op mijn gezondheid Vleesvervangers zijn gezonder dan vlees	Health_1 Health_2 Health_3
Innovation adoption	An attitude, consisting of affect, cognition and behaviour, that causes consumers to adopt or reject an innovation *(Breckler, 1984) (Tripartite model of attitude structure)*	**Cognitive:** I think meat alternatives are a good thing Meat alternatives are in line with what I think I have a positive opinion about meat alternatives	**Cognitive:** Ik denk dat de vervanging van vlees door vleesvervangers iets goeds is De vervanging van vlees door vleesvervangers komt overeen met mijn overtuigingen Ik heb een positieve mening over de vervanging van vlees door vleesvervangers	Ad_cog_1 Ad_cog_2 Ad_cog_3
		Behaviour: I intend to eat meat alternatives I intend to try out meat alternatives I will actively support the consumption of meat alternatives	**Behaviour:** Ik ben van plan om vleesvervangers te eten Ik heb de intentie om vleesvervangers te proberen Waar mogelijk zal ik de vervanging van vlees door vleesvervangers actief ondersteunen	Ad_beh_1 Ad_beh_2 Ad_beh_3
		Affect: Thinking about meat alternatives makes me feel glad Thinking about meat alternatives makes me feel happy Thinking about meat alternatives makes me feel satisfied	**Affect:** Ik verheug mij als ik denk aan de vervanging van vlees door vleesvervangers. Het denken over de vervanging van vlees door vleesvervangers maakt me blij Het denken over de vervanging van vlees door vleesvervangers stemt me tevreden	Ad_emo_1 Ad_emo_2 Ad_emo_3

Innovation resistance	A negative attitude, consisting of affect, cognition and behaviour that causes consumers to resist an innovation *(Breckler, 1984) (Tripartite model of attitude structure)*	**Affect**: I feel angry about the consumption of meat alternatives I feel strong negative emotions about the consumption of meat alternatives I fear the consumption of meat alternatives	**Affect:** Ik word boos als ik denk aan de vervanging van vlees door vleesvervangers Ik voel negatieve emoties als ik denk aan de vervanging van vlees door vleesvervangers Ik vrees de vervanging van vlees door vleesvervangers	Re_emo_1 Re_emo_2 Re_emo_3
		Cognitive: I don't think that the consumption of meat alternatives is a good idea The consumption of meat alternatives is absolutely not in line with what I think I have strong negative prejudices about meat alternatives	**Cognitie**: Ik denk niet dat de vervanging van vlees door vleesvervangers een goed idee is De vervanging van vlees door vleesvervangers is totaal niet in lijn met mijn overtuigingen Ik heb sterke negatieve vooroordelen over vleesvervangers	Re_cog_1 Re_cog_2 Re_cog_3
		Behaviour: I will file a complaint against the consumption of meat alternatives I will hinder the consumption of meat alternatives I will protest against the consumption of meat alternatives	**Gedrag:** Ik ga een klacht indienen tegen de vervanging van vlees door vleesvervangers Indien mogelijk zal ik de vervanging van vlees door vleesvervangers proberen tegen te houden Ik ben geneigd om te protesteren tegen de vervanging van vlees door vleesvervangers	Re_beh_1 Re_beh_2 Re_beh_3
Control Variables				
Gender		**What is your gender?** Man/woman/genderneutral/other	**Wat is uw geslacht?** Man/vrouw/genderneutraal/anders	

Age		**In which age category are you?** 15-30, 30-45, 45-60, 60+	**In welke leeftijdscategorie bevindt u zich?** 15-30, 30-45, 45-60, 60+	
Meat Consumption		**How many days do you consume meat?** 0-7	**Hoeveel dagen per week eet u vlees?** 0-7	
Innovativeness		I must see other people using innovations before I consider them I enjoy trying out innovations I am receptive to innovations	Ik moet andere mensen een innovatie zien gebruiken voordat ik ze overweeg Ik vind het leuk om innovaties uit te proberen Ik ben welwillend tegenover innovaties	Innov_1 Innov_2 Innov_3
Work experience		**What is your current occupation** Student/Working/Retired/Other	**Wat is momenteel voor u van toepassing?** Student/Werkende/ Gepensioneerd/Anders	

Appendix D - Demographic distribution of sample

		Frequency	Percentage %
Gender	Man	123	46,4
	Woman	137	51,7
	Gender neutral	4	1,5
	Other	1	0,4
Occupation	Student	165	62,3
	Working	94	35,5
	Retired	2	0,8
	Other	4	1,5
Age	15- 30 years	208	78,5
	30 - 45 years	24	9,1
	45- 60 years	25	9,4
	60+ years	8	3,0
Meat consumption (per week)	0	20	7,5
	1	12	4,5
	2	33	12,5
	3	38	14,3
	4	52	19,6
	5	48	18,1
	6	22	8,3
	7	40	15,1
City	Eindhoven	147	55,5
	Utrecht	33	12,5
	Nijmegen	85	32,1
N = 265			

Appendix E - Output Factor Analysis

Factor analysis - Adoption scale

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		,935
Bartlett's Test of Sphericity	Approx. Chi Square	2437,190
	df	36
	Sig.	0,000

Communalities - Adoption

	Initial	Extraction
Ad_cog_1	1,000	,749
Ad_cog_2	1,000	,671
Ad_cog_3	1,000	,831
Ad_beh_1	1,000	,728
Ad_beh_2	1,000	,643
Ad_beh_3	1,000	,743
Ad_emo_1	1,000	,787
Ad_emo_2	1,000	,796
Ad_emo_3	1,000	,802

Principal Component Analysis

Total Variance Explained - Adoption

Component	Total	Initial Eigenvalues % of Variance	Cumulative	Extraction Total	Sum of Squared % of Variance	Loadings Cumulative %
1	6,750	75,000	75,000	6,750	75,000	75,000
2	,584	6,489	81,488			
3	,414	4,603	86,092			
4	,104	3,858	89,949			

Extraction Method: Principal Component Analysis
*Table displays 4 out of the 9 components to only highlight relevant data.

Component Matrix - Adoption

	1
Ad_cog_1	,912
Ad_cog_2	,896
Ad_cog_3	,892
Ad_beh_1	,887
Ad_beh_2	,865
Ad_beh_3	,862
Ad_emo_1	,853
Ad_emo_2	,819
Ad_emo_3	,802

Extraction Method: Principal Component Analysis
a. 1 component extracted

Factor Analysis - Resistance Scale

KMO and Bartlett's Test - Resistance

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		,907
Bartlett's Test of Sphericity	Approx. Chi Square	1673,262
	df	36
	Sig.	0,000

Communalities - Resistance

	Initial	Extraction
Re_emo_1	1,000	,678
Re_emo_2	1,000	,767
Re_emo_3	1,000	,706
Re_cog_1	1,000	,647
Re_cog_2	1,000	,755
Re_cog_3	1,000	,645
Re_beh_1	1,000	,840
Re_beh_2	1,000	,805
Re_beh_3	1,000	,865

Extraction Method: Principal Component Analysis

Rotated Component Matrix - Resistance

	Component	
	1	2
Re_emo_1	,818	,313
Re_emo_2	,813	,215
Re_emo_3	,810	,315
Re_cog_1	,779	,198
Re_cog_2	,733	,331
Re_cog_3	,647	,509
Re_beh_1	,172	,914
Re_beh_2	,351	,847
Re_beh_3	,413	,797

Extraction Method: Principal Component Analysis

Total Variance Explained - Resistance

Component	Total	Initial Eigenvalues % of Variance	Cumulative	Extraction Total	Sum of Squared % of Variance	Loadings Cumulative %	Rotation Sums of Squared Loadings
1	5,609	62,325	62,325	5,609	62,325	62,325	3,871
2	1,100	12,218	74,543	1,100	12,218	74,543	2,838
3	,488	5,419	79,963				
4	,461	5,117	85,080				

Extraction Method: Principal Component Analysis
*Table displays 4 out of the 9 components to only highlight relevant data.

Factor Analysis - Cognitive and Affective Resistance scale

KMO and Bartlett's Test - Cognitive and Affective Resistance

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		,895
Bartlett's Test of Sphericity	Approx. Chi Square	974,532
	df	15
	Sig.	< ,001

Component Matrix - Cognitive and Affective Resistance

	1
Re_emo_2	,879
Re_cog_2	,869
Re_emo_3	,824
Re_emo_1	,811
Re_cog_1	,810
Re_cog_3	,781

Extraction Method: Principal Component Analysis

Behavioural Resistance scale factor analysis

KMO and Bartlett's Test - Behavioural Resistance

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		,752
Bartlett's Test of Sphericity	Approx. Chi Square	485,269
	df	3
	Sig.	< ,001

Rotated Component Matrix - Behavioural Resistance

	1
Re_beh_1	,918
Re_beh_2	,911
Re_beh_3	,907

Extraction Method: Principal Component Analysis

Factor analysis - Resistance and Adoption scale

KMO and Bartlett's Test - Resistance

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		,952
Bartlett's Test of Sphericity	Approx. Chi Square	4479.088
	df	153
	Sig.	,000

Pattern Matrix - Adoption and Resistance

	Component	
	1	2
Ad_cog_1	,796	-,106
Ad_cog_2	,857	
Ad_cog_3	,855	-,107
Ad_beh_1	,825	
Ad_beh_2	,711	-,139
Ad_beh_3	,848	
Ad_emo_1	,943	,116
Ad_emo_2	,984	,189
Ad_emo_3	,955	,121
Re_cog_2	- ,660	,312
Re_cog_3	-,543	,289
Re_cog_1	-,484	,399
Re_emo_1	-,460	,396
Re_beh_1		,894
Re_beh_2		,891
Re_beh_3		,881
Re_emo_1	-,302	,620
Re_emo_2	-,417	,505
Extraction Method: Principal Component Analysis		

Component correlation matrix

Component	1	2
1	1,000	-,527
2	-,527	1,000

Extraction Method: Principal Component Analysis
Rotation Method: Oblimin with Kaiser Normalisation

Factor analysis - Antecedents

Communalities - Antecedents

	Initial	Extraction
Volun_1	1,000	,797
Volun_2	1,000	,767
Volun_3	1,000	,969
Rev_Volun_3	1,000	,968
Unnatur_1	1,000	,513
Unnatur_2	1,000	,746
Unnatur_3	1,000	,732
Envir_1	1,000	,545
Envir_2	1,000	,562
Envir_3	1,000	,495
Anim_1	1,000	,705
Anim_2	1,000	,744
Anim_3	1,000	,699
Health_1	1,000	,753
Health_2	1,000	,771
Health_3	1,000	,641
Innov_1	1,000	,390
Innov_2	1,000	,686
Innov_3	1,000	,706

Extraction Method: Principal Component Analysis

Rotated Component Matrix - Antecedents

	Component					
	1	2	3	4	5	6
Volun_1					**,881**	
Volun_2					**,852**	
Volun_3			**,960**		-.175	
Rev_Volun_3			-,960		,175	
Unnatur_1	-,193	-,435		**,454**	,153	-,220
Unnatur_2		-,105		**,833**	-,112	.157
Unnatur_3	-,108	-,145		**,827**		
Envir_1	**,575**	,299		-,322	,125	
Envir_2	**,663**	,279		-,173		
Envir_3	**,556**	,354	,205		,102	
Anim_1	**,791**	,205				,184
Anim_2	**,840**	,171				
Anim_3	**,829**					
Health_1	,248	**,815**	,113			
Health_2	,218	**,836**				,123
Health_3	,287	**,704**		-,214		,130
Innov_1		,291	,306	,239	,109	-,376
Innov_2		,236				**,786**
Innov_3	,125	,101	,153			**,809**

Extraction Method: Principal Component Analysis
Rotation Method: Varimax wih Kaiser Normalisation

Total Variance Explained - Antecedents

Component	Total	Initial Eigenvalues % of Variance	Cumulative	Rotation Sums of Squared Loading Total	% of Variance	Cumulative %
1	5,213	27,439	27,439	3,388	17,834	17,834
2	2,388	12,567	40,006	2,600	13,682	31,516
3	1,679	8,837	48,843	2,084	10,968	42,484
4	1,488	7,834	56,676	1,884	9,810	52,294
5	1,266	6,663	63,339	1,666	8,766	61,060
6	1,154	6,607	69,413	1,587	8,353	69,413

Extraction Method: Principal Component Analysis
*Table displays 6 out of the 19 components to only highlight relevant data.

Factor analysis - Antecedents scale - Oblimin Rotation

KMO and Bartlett's Test - Antecedents (Oblique Rotation)

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		,793
Bartlett's Test of Sphericity	Approx. Chi Square	1758,631
	df	136
	Sig.	<,001

Communalities - Antecedents (Oblimin Rotation)

	Initial	Extraction
Volun_1	1,000	,706
Volun_2	1,000	,748
Rev_Volun_3	1,000	,394
Unnatur_1	1,000	,489
Unnatur_2	1,000	,735
Unnatur_3	1,000	,779
Envir_1	1,000	,538
Envir_2	1,000	,561
Envir_3	1,000	,525
Anim_1	1,000	,711
Anim_2	1,000	,709
Anim_3	1,000	,732
Health_1	1,000	,752
Health_2	1,000	,755
Health_3	1,000	,654
Innov_2	1,000	,727
Innov_3	1,000	,715

Extraction Method: Principal Component Analysis

Rotated Component Matrix - Antecedents (Oblimin Rotation)

	Component				
	1	2	3	4	5
Volun_1	,124	,827			
Volun_2		,862			
Rev_Volun_3	-,165	,582			
Unnatur_1			,462	-,191	-,318
Unnatur_2			,848	,175	
Unnatur_3			,876		
Envir_1	,477	,106	-,235		,256
Envir_2	,598				,228
Envir_3	,471			-,140	,425
Anim_1	,781			,158	
Anim_2	,842				
Anim_3	,907				-,240
Health_1					,865
Health_2					,862
Health_3			-,113		,739
Innov_2				,839	
Innov_3				,831	

Extraction Method: Principal Component Analysis
Rotation Method: Oblimin wih Kaiser Normalisation

Component correlation matrix - Antecedents (Oblimin Rotation)

Component	1	2	3	4	5
1	1,000				
2	-,007	1,000			
3	-,192	-,004	1,000		
4	,163	-,055	-,069	1,000	
5	,432	-,016	-,294	,223	1,000

Extraction Method: Principal Component Analysis
Rotation Method: Oblimin with Kaiser Normalisation

Appendix F - Pilot Studies

		Perc. Voluntariness	Perc. Unnaturalness	Perc. Green Value	Animal Welfare
Pilot I	Cronbach's alpha	.624	.809	.520	.833
	Std. Deviation	2.292	2.164	2.351	2.007
					*item 4 deleted
Pilot II	Cronbach's alpha	.778	.515	.796	.895
	Std. Deviation	2.661	1.820	2.097	1.867
		*item 3 reversed			

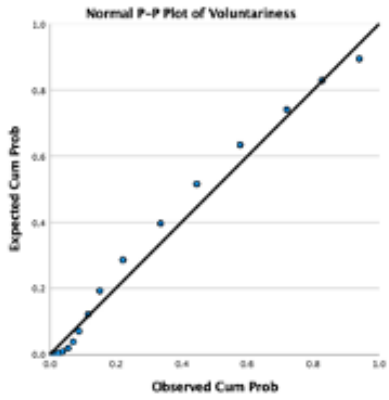
		Perc. Healthiness	Innovation	Adoption	Resistance
Pilot I	Cronbach's alpha			.901	.834
	Std. Deviation			6.117	4.852
Pilot II	Cronbach's alpha	.841	.450	.913	.948
	Std. Deviation	2.337	2.463	6.199	.7.711
			*item 2 reversed		

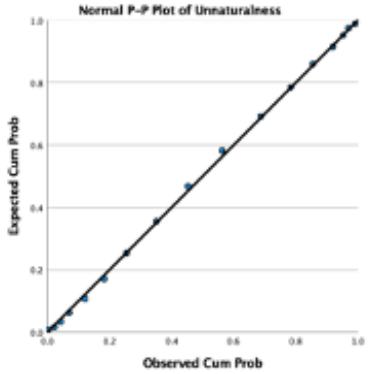
Appendix G - Assumption Testing

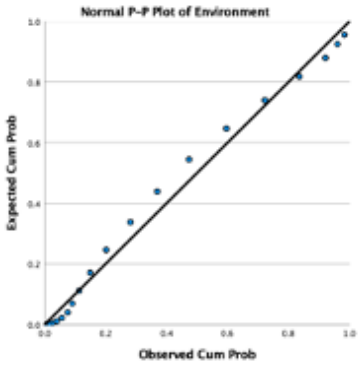
Assumption II - Normality

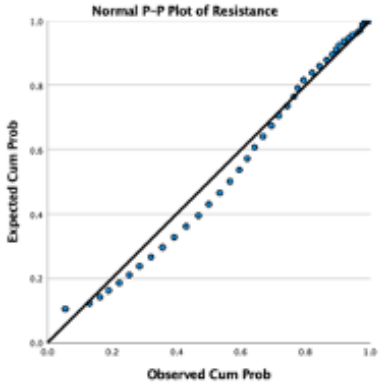
	Adoption	Resistance	Voluntariness	Unnaturalness	Animal Welfare	Health
N	265	265	265	265	265	265
Mean	4,346	2,551	5,624	4,426	5,064	3,834
Std. Dev.	1,476	1,239	1,101	1,149	1,466	1,208
Skewness	-,158	,791	-,1,113	-,088	-,754	-,022
Kurtosis	-.668	,335	1,257	-,330	,076	,405
Min	1,00	1,00	1,00	1,00	1,00	1,00
Max	7,00	7,00	7,00	7,00	7,00	7,00

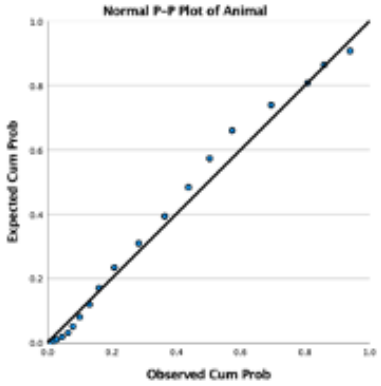
	Greenness	Innovativeness	Gender	Occupation	Age	Meat Consumption
N	265	265	265	265	265	265
Mean	4,860	5,293	,560	,420	,370	3,970
Std. Dev.	1,257	,968	,548	,591	,778	2,035
Skewness	-,754	-,585	,391	1,551	2,022	-,228
Kurtosis	,076	,165	-,032	3,525	2,966	-,725
Min	1,00	1,00	1,00	1,00	1,00	1,00
Max	7,00	7,00	7,00	7,00	7,00	7,00

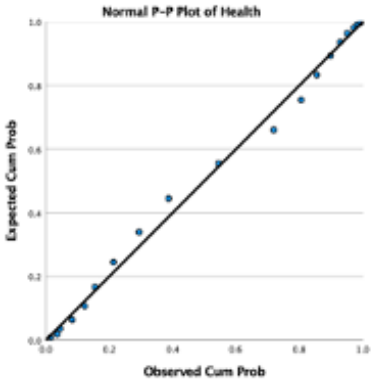

Normal P-P Plot of Voluntariness
Expected Cum Prob
Observed Cum Prob

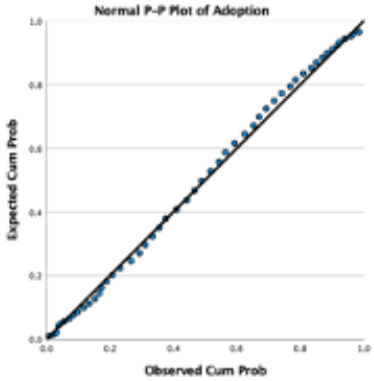

Normal P-P Plot of Unnaturalness
Expected Cum Prob
Observed Cum Prob


Normal P-P Plot of Environment
Expected Cum Prob
Observed Cum Prob

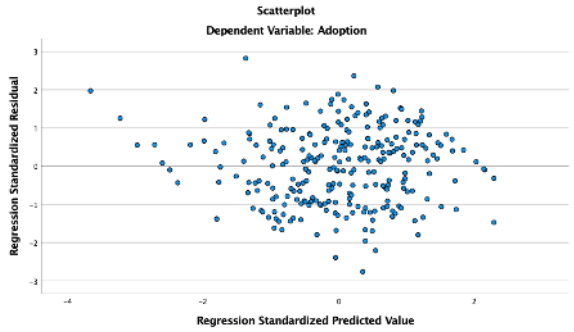

Normal P-P Plot of Resistance
Expected Cum Prob
Observed Cum Prob

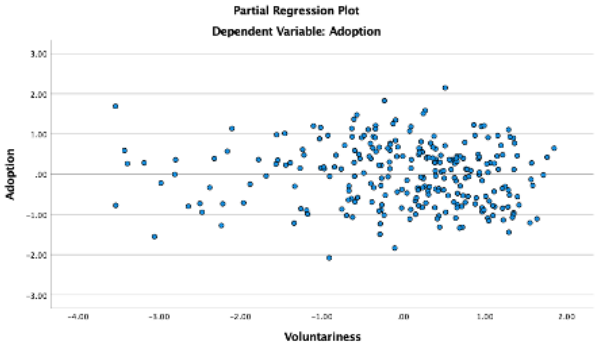

Normal P-P Plot of Animal
Expected Cum Prob
Observed Cum Prob

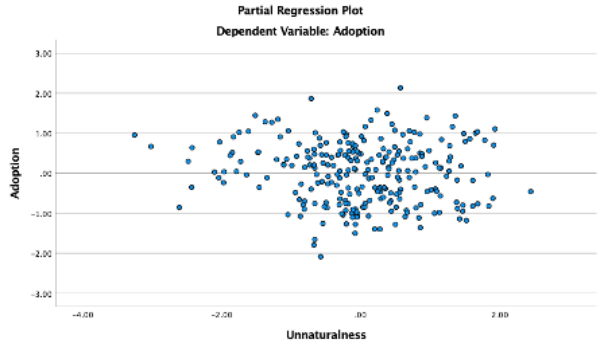

Normal P-P Plot of Health
Expected Cum Prob
Observed Cum Prob

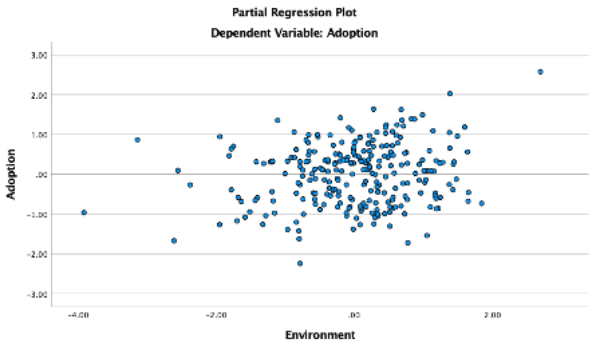

Normal P-P Plot of Adoption
Expected Cum Prob
Observed Cum Prob

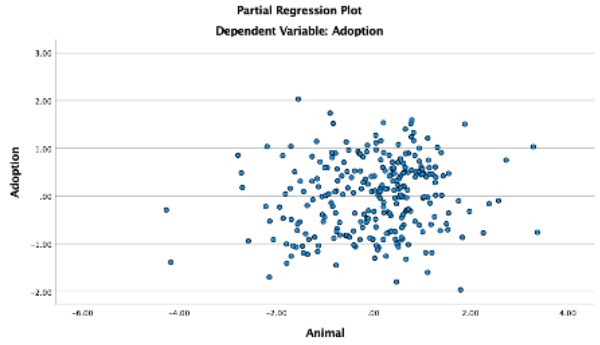
Assumption IV - Homoscedasticity

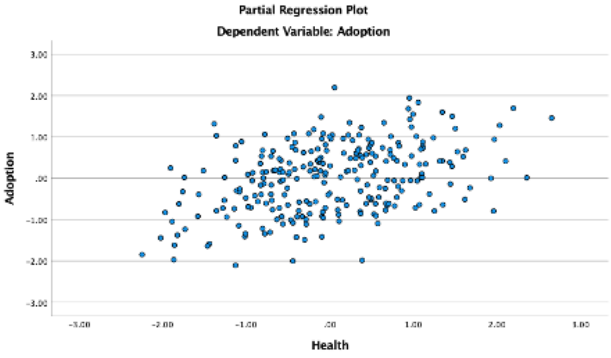












Appendix H - Multiple Regression Output

Multiple Regression - DV: Adoption

Model Summary - Adoption

	R	R Square	Adjusted R Square	Std Error of the Estimate	Durbin-Watson
1	,841	,707	,689	,824	2,067

Dependent Variable: Adoption
Predictors: (Constant), Healthiness, Animal welfare, Greenness, Voluntariness, Unnaturalness, Innovativeness, Age, Gender, Occupation

ANOVA - Adoption

	Sum of Squares	df	Mean Square	F	Sig
Regression	406,636	16	25,415	37,472	<.001
Residual	168,201	248	,678		
Total	574,837	264			

Dependent Variable: Adoption
Predictors: (Constant), Healthiness, Animal welfare, Greenness, Voluntariness, Unnaturalness, Innovativeness, Age, Gender, Occupation

Multiple Regression - DV: Resistance

Model Summary - Resistance

	R	R Square	Adjusted R Square	Std Error of the Estimate	Durbin-Watson
1	,754	,568	,541	,840	1,908

Dependent Variable: Resistance
Predictors: (Constant), Healthiness, Animal welfare, Greenness, Voluntariness, Unnaturalness, Innovativeness, Age, Gender, Occupation

ANOVA - Resistance

	Sum of Squares	df	Mean Square	F	Sig
Regression	230,471	16	14,405	20,416	<.001
Residual	174,980	248	,706		
Total	405,452	264			

Dependent Variable: Resistance
Predictors: (Constant), Healthiness, Animal welfare, Greenness, Voluntariness, Unnaturalness, Innovativeness, Age, Gender, Occupation

Multiple Regression - DV: Cognitive- Affective Resistance

Model Summary - Cognitive-Affective Resistance

	R	R Square	Adjusted R Square	Std Error of the Estimate	Durbin-Watson
1	,762	,580	,553	,917	1,890

Dependent Variable: Cognitive-Affective Resistance
Predictors: (Constant), Healthiness, Animal welfare, Greenness, Voluntariness, Unnaturalness, Innovativeness, Age, Gender, Occupation

ANOVA - Cognitive-Affective Resistance

	Sum of Squares	df	Mean Square	F	Sig
Regression	288,377	16	18,024	21,410	<.001
Residual	208,775	248	,824		
Total	497,151	264			

Dependent Variable: Cognitive-Affective Resistance
Predictors: (Constant), Healthiness, Animal welfare, Greenness, Voluntariness, Unnaturalness, Innovativeness, Age, Gender, Occupation

Multiple Regression - DV: Behavioural Resistance

Model Summary - Behavioural Resistance

	R	R Square	Adjusted R Square	Std Error of the Estimate	Durbin-Watson
1	,592	,352	,310	1,060	1,974

Dependent Variable: Behavioural Resistance
Predictors: (Constant), Healthiness, Animal welfare, Greenness, Voluntariness, Unnaturalness, Innovativeness, Age, Gender, Occupation

ANOVA - Behavioural Resistance

	Sum of Squares	df	Mean Square	F	Sig
Regression	151,377	16	9,461	8,417	<.001
Residual	278,747	248	1,124		
Total	430,123	264			

Dependent Variable: Behavioural Resistance
Predictors: (Constant), Healthiness, Animal welfare, Greenness, Voluntariness, Unnaturalness, Innovativeness, Age, Gender, Occupation