How to improve consumer contribution to the CSR agenda? Utilising the example of CO2 emission reduction in the dairy industry

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Abstract

Over the past two decades, sustainability has become an important strategic goal for companies in all industries. Under the headline of sustainability, environmental protection has gained importance in business, politics, and civil society. Alongside other topics in the context of environmental protection, Greenhouse Gas Emissions play one of the most important roles in many industries and the concern around them is often manifested in a focus on CO_2 emission reduction. The international focus on low Greenhouse Gas Emissions development strategies was established by the United Nations Climate Conference in 1992, first measures were implemented with the Kyoto Protocol (1997) which later in 2015 was superseded by the Paris Agreement. In Paris a commitment was made to limit the global average temperature increase to well below 2°C above pre-industrial levels and to pursue efforts to limit this temperature increase to 1.5°C above pre-industrial levels. Household and individual consumption behaviours account for a substantial share of CO_2 emissions and there is general consensus that human consumption contributes to environmental problems.

Within the academic literature, there is an increasing number of studies devoted to pro-environmental consumer decision making, mainly focusing on high involvement purchase decisions and pro-environmental consumer behaviour. The aim of this study is to empirically examine the consumer pro-environmental decision-making process in the context of low involvement "everyday" products, such as dairy products, to support the industry in strengthening consumer contribution to the CO_2 emission reduction goals of dairy companies. In addressing the research aims, two theoretically-grounded frameworks that are often used in consumer psychology and marketing literature, namely the Behavioural Reasoning Theory and the Norm Activation Model, have been combined and applied.

The theoretical framework of this study proposes that consumer purchase intention can be predicted through global motives (i.e. attitude, social norms, and behavioural control), as well as altruistic and pro-social motives (i.e. personal norms). Including context specific "reasons for" and "reasons against" the consumer decision within the framework helps to explain the attitude further by including a justification argument for these decisions. Data used for this research have been collected through an electronic self-completion questionnaire using a random sample (n=791) of German consumers, aged between 18 and 64 years old. The data has been analysed using the Partial Least Square Structural Equation Model. The results confirm

that the consumer consideration of CO_2 emission reduction when purchasing food products, such as dairy products, is mainly driven by personal norms and attitude. The pro-social motives have a stronger impact than attitude and significantly strengthen consumer attitude. The main reason justifying the consumers' purchase intention is the environmental benefits related to the purchase of the products. On the other hand, the main "reasons against" their purchase intention is scepticism towards the industry's investment in CO_2 emission reduction, doubts whether dairy companies have the possibility to change and control the whole supply chain, and uncertainty whether a change in the own consumer purchase behaviour has an impact.

This study advances the academic literature and has implications for practitioners. Its academic contribution is primarily demonstrated in the moral obligations aspects of decision making that can strengthen the purchase decision for low involvement consumer products, such as dairy products. A more in-depth consideration of contextual reasons can further develop a better understanding of the consumer purchase decision. From the perspective of practitioners, the study facilitates the development of strategies to reinforce consumer attention to CO_2 emission reduction in the food industry, especially the dairy industry, and helps to increase consumer contribution to ambitious company goals around CO_2 emission reduction.

Acknowledgements

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Abbreviation	Definition
AC	Awareness of consequences *(short description of the reason construct)*
AR	Ascription of responsibility *(short description of the reason construct)*
AT	Attitude *(short description of the reason construct)*
BC	Behavioural Control *(short description of the reason construct)*
BRT	Behavioral Reasoning Theory *(short description of the reason construct)*
CAP	Common Agriculture Policy
CH_4	Methane
CO_2	Carbon dioxide
CSR	Corporate Social Responsibility
DSF	Dairy Sustainability Framework
EBE	Environmental Benefits
EEA	European Environment Agency
EU	European Union
FAO	Food and Agriculture Organisation
FPCM	Fat and protein corrected milk
GHG	Green House Gas
$GTCO_2$	1 Gigatonne Carbon dioxide equivalent
HFC_6	Hydrofluorocarbons
IOD	Image of Dairy *(short description of the reason construct)*
IPCC	The Intergovernmental Panel on Climate Change
ISCED	International Standard Classification of Education
IT	Intention *(short description of the reason construct)*
KPI	Key Performance Indicator
MNEs	Multinational Enterprises
N_2O	Nitrous Oxide
NAM	Norm Activation Model
ODC	Other Decision Criteria *(short description of the reason construct)*
PBC	Perceived Behavioural Control
PFC	Perfluorocarbons
PLS	Partial Least Squares
PN	Personal Norms *(short description of the reason construct)*
SDG	Sustainability Development Goals
SEM	Structural Equation Model
SF_6	Sulfur hexafluoride
SFCs	Perfluorocarbons
SKM	Skepticism *(short description of the reason construct)*
SN	Social Norms
TBL	Triple Bottom Line
TPB	Theory of Planned Behavior
TRA	Theory of Reasoned Action
TRU	Trust *(short description of the reason construct)*
UN	United Nations
UNFCCC	United Nations Climate Change Conferences
UN Aquastat	FAO's Global Information System on Water and Agriculture

Chapter 1: Introduction

1.1   Background of the study

Over the years, growing attention has been paid to the ethical, environmental and social dimensions of business, most often under the corporate social responsibility (CSR) heading. Multinational companies face a growing pressure to account for social, environmental and ethical problems occurring in various locations of operation, often dealing with different norms and standards.

One example is the focus on Climate Change during recent years, internationally established with the United Nations Climate Change Conferences (UNFCCC) in 1995 in Berlin and the Paris Agreement in 2015 (United Nations, 2017). The goals set during the UNFCCC 1995 and within the Paris Agreement are followed up by yearly meetings where the objectives and obligations for all countries with respect to climate action are updated in accordance with recent developments. Within the Paris Agreement, the UN countries committed themselves to "holding the increase in the global average temperature to well below 2 °C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5 °C above preindustrial levels" (UNFCCC, 2015). In order to achieve the global target of 2 °C above pre-industrial levels, Greenhouse Gas Emissions (GHG) need to be reduced to 23 $GTCO_2e$ per year by 2050 (Climate Action Tracker, 2017). In many countries, the proposed targets for 2030 fall short of 1.5°C combability and it is expected that in 2021 all countries will submit new targets for 2030. As part of the European Union and its Member States, Germany also has an obligation to upgrade its 2030 targets, and already published new targets in May 2021 with a view to achieve climate neutrality in 2045, five years earlier than stated in the previous agreement. In accordance with the Paris Agreement GHG are the major anthropogenic greenhouse gases, namely: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O) and three groups of fluorinated gases sulfur hexafluoride (SF_6), hydrofluorocarbons (HFCs), and perfluorocarbons (PFCs)).

Multinational companies are part of the main actors in the international globalized economy and, as such, are able to accelerate or slow down the possibility to reach set climate targets (McIntyre et al., 2009; Zhang et al., 2020). For these companies, "The consequences of climate change will have significant impact on the firm globally, which is therefore dealt with at the highest management level" (Pinske and Kolk, 2009). Multinational Enterprises (MNEs) have adopted different environmental strategies, for example: Coca-Cola redirected its strategy to

reach water consumption neutrality by 2020 (Kent and Ignatius, 2011); Tesla Motors rests its entire strategy on the idea of sustainable sources of energy (The Guardian, 2015); and IKEA ties its business strategy to the achievement of key environmental performance indicators (Barner, 2007).

Air emissions assigned to three main categories – Greenhouse Gas Emissions (GHGe), acidification emissions and emissions of ground ozone precursors - are one of the main topics in relation to the climate targets and accounts for the greatest portion of the warming associated with human activities (IPCC, 2013). Four sectors dominate the GHG emissions in Europe, namely: (1) agriculture, hunting, forestry and fisheries (agriculture); (2) electricity, gas and water supply (electricity industry); (3) manufacturing; *and* (4) transport, storage and communication (transport services) (EEA, 2013). Looking at the product groups, the four groups which contribute to the environmental pressures within the EU by 30-50% are: (1) construction works; (2) food products, beverages and alcohol; (3) products of agriculture, forestry and fishing; *and* (4) electricity, gas, steam and hot water (electricity) (EEA, 2013) . Considering the food industry, current food systems are responsible for approximately one-quarter of anthropogenic greenhouse gas emissions and are the leading cause of deforestation, biodiversity loss, freshwater use and water pollution (Edenhofer et al., 2014; Tubiello et al., 2013).

This study will use CO_2 emissions as synonym for the different anthropogenic greenhouse gas emission categories. The reasoning behind this is that in the context of consumer purchase decisions, differentiating between categories is not considered to contribute materially to the discussion. In the German context, CO_2 emission reduction is considered as the common and most widely accepted wording when dealing with climate change in the context of this discussion in politics, industry and amongst the general public.

Household and individual consumption behaviours account for a substantial share of the CO_2 emissions and there is general consensus that human consumption contributes to environmental problems (EEA, 2012). The consumption categories of housing and utilities, mobility, and food account for around half of the European household expenditure and cause more than two-thirds of direct and indirect environmental pressure (EEA, 2013). Looking at the food consumption, dietary guidelines have been defined which vary from country to country. When considering the dietary guidelines for different countries, it is obvious that dairy plays an important role in

all countries. Milk and dairy intake is discussed in the global nutritional guidance in terms of under-consumption and calcium deficiency (Legius et al., 1989; Kumssa et al., 2015); therefore a minimum threshold has been defined (Ritchie et al., 2018).

On the basis of dietary guidelines for dairy intake, impact of dairy products on GHG emissions in a country like Germany account for around 25% of the per capita GHG emissions (Ritchie et al., 2018); this is a considerable amount, which warrants attention. Dairy companies are working hard to reduce their production-based CO_2 emissions, while at the same time providing assurance that they will support the dietary recommended intake globally. Large investments are made to apply new technologies for farming and production, ensure better and cleaner energy usage, and improve the feeding and conditions for livestock as well as the nutritional density of dairy products.

1.2   The dairy industry and CO_2 emission reduction

An increasing number of dairy companies are focusing their CSR strategies on the environmental impact of food production and consumption and have integrated sustainability goals into their strategy. Their priorities are manifested in the UN Sustainability Development Goals (SDG) "Climate Action" (Goal 13) and "Responsible Consumption and Production" (Goal 12). The world's biggest dairy companies have implemented ambitious goals in connection with improving the environmental impact of their production ("Carbon Zero by 2050" – Arla, "Carbon neutral by 2050" Danone, Nestlé is planning to run all factories on 100% renewable electricity by 2025. Focus has been placed on environmentally friendly production of dairy products – from farming and manufacturing to product disposal. CO_2 emission reduction is one of the goals companies are aiming towards. Arla Foods amba, for example, has reduced its CO_2 emissions for the production, packaging and transport by 24% between 2015 and 2020. Their farms have reduced their CO_2 emissions per kg of milk by 22% between 1990 and 2020. Arla also uses 35% renewable energy in their production sites and has even set more ambitious goals for the coming years. Furthermore, end of 2020 Arla launched carbon zero milk in Denmark, following the launch in Sweden one year earlier (Arla, 2021). By paying climate compensation, which means that Arla is investing in projects that absorb the same amount of carbon that is emitted in the production and transport of the products. This approach provides Arla with time to improve and reduce the climate impact until it reaches the carbon net zero

goal by 2050 by at the same time contributing to CO2 emission reduction on a higher level immediately. Arla communicates the CO_2 neutrality on their milk cartons in Denmark and Sweden. Danone aims to achieve Carbon Net Zero by 2050 (Danone Nature Score Card, 2018) by reducing GHG emissions in line with the $2^{o}C$ Scenario and contributing to the establishment of a decarbonized economy. Their strategy includes five main goals: (1) cut emissions across the board; (2) foster carbon positive solutions; (3) eliminate deforestation from their supply chain by 2020; (4) build resilience around the food and water cycle; *and* (5) offer healthier and more sustainable dieting solutions (Danone climate policy, 2016). The Ehrmann GmbH website highlights their commitment to carbon neutrality through the implementation of measures to reduce CO_2 emissions and investment in their compensations project regarding water, power and deforestation. They also claim to be one of the leading companies in the dairy industry. Other big German dairy companies do not include information about sustainability and their contribution to the CO_2 emission reduction on their websites (Ehrmann, 2021).

Furthermore, major dairy companies are diversifying and offering plant-based alternatives to, on the one hand, differentiate and, on the other hand, strengthen their sustainability agenda. Plant-based products are considered to be naturally healthy. There is also an ongoing discussion in the market around whether these products are considered more environmentally friendly. Market research indicates that an increasing number of consumers consider plant-based alternatives to be a more sustainable solution (Innova, 2022). Other sources show, that some consumers start to question the sustainability and naturalness of plant-alternatives in dairy alternatives like for example soy and almond milk (Euromonitor, 2021). Companies like Danone are investing heavily in this market and have already launched several plant-based product lines. Others like "Life real farms" are starting to focus on hybrid products, combining dairy and plant-based milk. Purchase drivers of plant-based products include the novelty factor, the natural "heath halo" factor, reduction or even avoidance of meat-consumption (flexitarian, vegetarian, vegan), dietary requirements (e.g. dairy intolerance), and also sustainability (NNB, 2021 and 2022; Innova, 2021 and 2022; Euromonitor, 2021). Main driver for considering plant-based alternatives is that consumers consider these as healthier, but sustainability is gaining more and more importance when choosing plant-based alternatives (Innova, 2022).

The main question is, how can companies increase the contribution of consumers to their CSR agenda by making pro-environmental choices during their daily low involvement purchase decisions. If consumers support these companies' CO_2 emission reduction goals, it will become,

on the one hand, a requirement for all dairy companies to improve their CO_2 emissions and, on the other hand, it will support companies' investment in the achievement of ambitious goals and making a difference.

1.3   Consumer contribution to CO_2 emission reduction

Public and political discussion, as well as mass media attention, regarding climate change and CO_2 emissions have increased environmental awareness and have influenced consumer awareness (Baiardi and Morana, 2021; Kaiser et al., 1999). The increasing focus on environmental protection requires companies to invest large sums in environmental protection and CO_2 emissions reduction throughout the whole value chain. To make environmental protection part of consumers' purchase decision and secure a higher net value, the understanding of the consumer purchase decision process for high and low involvement products has to be more robust and include different product categories (Biswas and Roy, 2015; Cherian and Jacob, 2012: Lin and Huang, 2012). An increasing number of studies deal with some kind of pro-environmental consumer behaviour (*e.g.* Shin et al., 2018; Park and Ha, 2014; Han 2015), but there is still a lack in understanding around the consumer purchase decision process and the consideration of CO_2 emissions, especially in the purchase decision process for low involvement products. The market figures start to show some kind of success. The sustainable market share index for the US published by Kronthal-Secco and Whelan (2021) shows that across different food and hygienic products the share of sustainability-marketed products have increased from 13,7% share of market ($) in 2015 to 16,1% in 2019. Wageningen University (2021) in the Netherlands reports that consumers spent 7% more on animal, human and environmentally friendly products in 2020, leading to a reported spending of € 8,2 billion.

The question is, how can individuals be motivated to minimize environmentally detrimental activities, especially when making low involvement decisions, which are typically low cost, low risk, involve limited upfront information, and are often frequently conducted. They include the purchase of food products (Knox and Walker, 2003), some clothing (Parkvithee and Miranda, 2012), and staple goods, such as petrol (Dugar, 2013). The cumulative effect of these purchases is significant; Ivanova et al. (2015) suggests that in the EU food shopping accounts for 9.5% of all carbon produced, whereas petrol consumption accounts for approximately 13% of all carbon produced. To strengthen the environmentally responsible consumer behaviour it

is important that consumers consider all environmental effects of all purchases (Laroche et al., 2001), including their low involvement daily consumption (Thøgersen et al., 2012). Considering the impact of decision making for low involvement products, which represent the majority of daily consumption decisions and collectively have a substantial negative environmental impact (Beharrell and Denison, 1995; Lastovicka and Gardner, 1978; Thøgersen et al., 2012; Coskun et al., 2017) helps to build a better understanding of how environmental considerations are integrated into simple daily decision-making processes and whether the intention to purchase products for daily consumption is mediated by consumers' environmental orientation.

Today, consumer concerns around business activities regarding the environment, animal welfare and social responsibility appear to be increasingly affecting their purchase decisions. Consumers are no longer indifferent to environmental issues such as pollution and global warming. Apart from the price and quality qualities of the products, they assess whether they are environmentally friendly or not (Tandon and Sethi, 2017). Consumers acting on their ethical concerns can even force a change in production and marketing activities (DePelsmacker et al., 2005); the most obvious way is through boycotts (Friedman, 1995; Rudell, 2006). One example of this intervention is the shift in European consumer demand from cage-laid eggs to free range eggs which was driven by animal welfare concerns (Rolfe, 1999) and led to legislation to phase out conventional layer hen cages in the European Union (Appleby, 2004). However, in order to encourage consumers to act in a more environmentally friendly manner when making their low involvement purchase decisions, they need to consider the environmental impact of the majority of the low involvement good consumption, including the daily consumption (Laroche et al., 2001; Thøgersen et al., 2012; Coskun et al., 2017).

To the best knowledge of the author, there are no existing studies examining the CSR strategy of dairy companies with a focus on CO_2 emission reduction and consumer contribution. Hence, this research will focus on the role of CSR ambitions with focus on the environment and influence on the purchase intention of consumers when purchasing dairy products. A better understanding of the link between the company's CSR strategy and ethical purchase intention becomes crucial if practitioners and governments want to enhance consumers' ethical purchase behaviour, thereby increasing consumers' contribution to the ethical agenda and supporting companies to fulfil their commitment manifested in the SDG, especially with respect to CO_2 emission reduction goals.

1.4 Problem statement

Dairy manufacturers' CSR strategy includes achieving "Carbon Net Zero" by 2050 and contributing to efforts to limit the temperature increase to 1.5 °C above preindustrial levels (UNFCCC, 2015) . The dairy industry is a major contributor to CO_2 emissions caused by the farming sector and the manufacturing process. The major players are investing heavily in reducing their carbon footprint by establishing new technologies to reduce their energy consumption in the production process, use renewable energy, provide better feed for their livestock, and improve packaging.

While CO_2 emission reduction is not an industry standard, it is important for companies who are actively working towards this that consumers are aware of their ethical strategy. Consumers need to be aware of a company's pro-environmental initiatives and clear commitment to CO_2 emission reduction in order to include pro-environmental considerations into their purchase decision and thereby contribute to the company's objectives.

Within the dairy industry, stronger consumer involvement will provide companies with the possibility to gain support for their environmentally responsible approach, will contribute to their "Carbon Net Zero" by 2050 goal, and will force more companies to invest in CO_2 emission reduction. This, in turn, will mean that considerations around CO_2 emission reduction will form part of every business model.

A review of existing literature indicates that pro-environmental consumer behaviour when purchasing low involvement products, such as dairy products, has not been previously examined. Therefore, it is not clear whether consumers are aware of the CO_2 emission problems caused by the dairy industry, nor whether they include environmental considerations as an important decision-making factor when buying dairy products. In order to define a strong and impactful marketing and communication strategy, it is important that dairy companies are aware of the current motivational status of consumers and how to best approach consumers to increase their contribution to the company's CO_2 emission reduction goals.

1.5 Research aim and objectives

A review of the literature reveals that an individual's pro-environmental behaviour is predominantly believed to be motivated by self-interest (e.g. to minimize one's health risk) or

pro-social motives (e.g. the concern for other people, future generations, other species, or the whole eco-system) (Bamberg et al., 2007). The main focus is on attitudinal models like the Theory of Reasoned Action (TRA) or Theory of Planned Behaviour (TPB) (Ajzen, 1991), which concentrate on self-interest motives. Westaby (2005) built on the TPB and developed the Behavioural Reasoning Theory (BRT), which includes context specific "reasons for" / "reasons against" influencing the attitude towards the behaviour. This approach added valuable insights to facilitate the understanding of the decision process, provided contextual information around increasing the individual's feeling of confidence in the decision, and included additional cognitive routes. The additional explanatory power of this approach is confirmed by high involvement decisions like sustainable transportation, renewable energy systems, mobile banking, employee turnover and relocation decisions (Peterson and Simkins, 2019; Diddi et al., 2019; Gupta and Arora, 2017; Miralles et al., 2017; Claudy et al., 2013).

Other studies, especially research on consumer purchase decisions with respect to high involvement products and services, use pro-social theories like the Norm Activation Model (NAM) (Schwartz, 1970, 1975) which is used to predict people's altruistic and pro-social behaviour (DeGroot and Steg, 2009). Pro-environmental behaviour is considered as pro-social behaviour because it involves positive consequences for others (Steg and DeGroot, 2010) and includes any type of behaviour that mitigates a harmful impact of the action on the environment (Kollmuss and Agyeman, 2002).

In the recent years, researchers have started to combine self-interest and pro-social approaches to improve the predictive power of behavioural intention building in the context of pro-social and pro-environmental decision making (Shin et al., 2018; Park and Ha, 2014; Han 2015).

This research sets out to strengthen the predictability of consumers' behavioural intention to buy dairy products where CO_2 emission reduction considerations in the production process are part of the communication strategy. A better understanding of consumer decision making for low involvement products when purchasing daily groceries, such as dairy products, is valuable because the dairy industry production process has a high impact on CO_2 emissions and dairy companies are investing a lot to reduce CO_2 emissions, with ambitious goals. The industry's contribution to CO_2 emission reduction could be strengthened if consumers were to start to consider products from companies with an higher pro-environmental involvement. This would mean that they would contribute to the company's CSR agenda.

With a view to attaining a deeper understanding of consumer purchase intention for dairy products produced by companies committed to CO_2 emission reduction, this research uses two theoretical models - the BRT and the NAM. Both theoretical models show a good predictability of behavioural intention in the pro-environmental context. By using constructs from both models, this research expects further improvement of the predictability of behavioural intention.

In summary, this research aims to combine pro-social and self-interest constructs as determinants of consumers' intention-building for their purchase decision to buy dairy products produced where CO_2 emission reduction considerations form part of the manufacturing process. In order to achieve the overall research aim, the main objectives of this research are:

- Develop a conceptual framework based on a strong theoretical background to understand the self-interest and pro-social motives of consumers' purchase decision making for dairy products; *and*
- Investigate the main factors that drive the purchase decision for dairy products where CO_2 emission reduction forms part of the production process.

This research aims to contribute to the academic and managerial literature within the domain of consumer purchase decision behaviour, specifically in the context of low involvement products.

- The conceptual framework sets out to advance the consumer purchase decision making models by integrating a pro-social and a self-interest approach in the context of a low involvement decision making.
- The conceptual model includes context specific "reasons for" and "reasons against" adding the justification and defence mechanism to the model and providing further insights into anticipated behaviours which are expected to improve the understanding of consumers' purchase decisions.
- The research aims to add to the understanding of consumers' motivational stage of considering CO_2 emission reduction in their behavioural intention-building when purchasing low involvement products like dairy products.

- This research sets out to support the dairy industry in attracting consumers' attention to CO_2 emission reduction in order to support companies and society in reducing global warming and reaching the goals of the Paris Agreement temperature target.

1.6   Structure of the research

The thesis comprises eight different part presented in eight chapters which are outlined below: In part 1 (chapter 1.1 to 1.5) the topic of the thesis is introduced. Chapter 1.1 outlines the background of the study. Chapter 1.2 the CO_2 emission reduction within the dairy industry is introduced followed by three chapters (1.3 to 1.5) briefly defining the research gap, problem statement and research aim and objective.

Part 2 comprises an introduction to CO_2 emission reduction goals and strategies and the approach of the dairy industry. The chapter provides an overview of CO_2 emission reduction of the dairy industry in context of the 17 SDGs and the CSR strategies of the dairy companies. This chapter includes 3 different parts. Chapter 2.1 introduces the concept of CSR and Sustainability in connection with climate change. Chapter 2.2 discusses the CO_2 emission reduction in the context of the dairy industry. Chapter 2.3 deals with sustainable diets and consumer behaviour. Chapter 2.4 introduces consumer decision making theories focusing on self-interest and pro-social theories.

Chapter 3 puts the consumer perspective to CO_2 emission reduction into the context of the dairy industry. After a short introduction (chapter 3.1), chapter 3.2 introduces the consumers' consideration of CO_2 emission reduction and their pro-environmental activities in Europe. Chapter 3.3 looks into the consumer green purchase decision and links it to CO_2 emission reduction topic under the heading of pro-environmental consumer purchase decision. The impact of the dairy industry in the discussion of CO_2 emission reduction in the industry and especially the food industry is pointed out. In chapter 3.4 the different theoretical models used to analyse the pro-environmental behaviour are introduced – mainly the Theory of Planned Behaviour (TPB), Theory of Reasoned Action (TRA) and the Norm Activation Model (NAM). In order to empirically address the research question, chapter 4 proceeds by introducing the chosen theoretical frameworks in detail – the Behavioural Reasoning Theory (BRT) and the Norm Activation Model (NAM) in chapter 4.2 and 4.3. Chapter 4.4 outlines the rational of combining the two named theoretical frameworks in context of the research objective. In the

following chapter 4.5 the hypothesis for this research are developed. In the last part (4.6) the developed research model is presented.

Chapter 5 comprises the introduction to the applied research methodology. After a short introduction, the philosophical orientation and the corresponding paradigm within which the study is conducted is introduced (chapter 5.2). The choice of a survey with a self-completion questionnaire used in an online survey to answer the research questions is justified in chapter 5.3. Chapter 5.4 and 5.5 comprises the research methodology and the data sampling approach used for this research.

Chapter 6 gives a detailed overview over the data collection, the development of the questionnaire, the chosen measurements, and data cleaning. For the data analysis the Structural Equation Modelling (SEM) is used and explained in chapter 7. Chapter 7.2 gives an overview over the two different SEM approaches and the choice of the Partial Least Square (PLS) - SEM is discussed and justified in chapter 7.3. In chapter 7.4 the measurement and structural model as well as the mediation and moderation effects are analysed.

In chapter 8 the findings of the research are discussed in detail (chapter 8.2). The overall conclusion with the contribution to knowledge and the implication for practitioners are presented. The thesis is concluded by outlining limitations of this research and provides suggestions for future research (chapter 8.3).

Chapter 2: CSR and CO$_2$ Emission Reduction

2.1 Introduction

Traditionally CSR has been conceptualized as "the managerial obligation to take action to protect and improve both the welfare of society as a whole and the interest of organizations" (Davis and Blomstrom 1975, p. 6). Over time, this conceptualization has developed from a purely economic perspective (Friedmann, 1970, Zenisek, 1979), to an integrated approach including economic, legal, ethical and philanthropic perspectives (Carroll, 1979, 1991), to a societal view of CSR adopted by Brown and Dacin (1997) (Sen and Bhattacharya, 2001), and to CSR theories based on Freemann's (1984) stakeholder theory where the company facilitates CSR management, focusing on the individuals or groups who are affected by the company directly or indirectly.

In the past, organisations demonstrated their responsibility to society through social and philanthropic activities and focused on charitable or local institutions (Smith, 2003; Auld et al., 2008) addressing social or environmental issues (Auld et al., 2008). With these contributions, they often served their obligations to society without internalizing CSR into their business model (Auld et al., 2008; Silberhorn and Warren, 2007). In recent years CSR has become an integrated part of business practice (Hastings and Angus, 2011) and an important part of the business strategy emphasizing transparency, responsiveness and accountability (Abdeen et al., 2016). Today, nearly all larger companies – both national and international - have implemented CSR communication in their yearly reporting and have started to implement clear measurements and KPIs in this respect. There are many different CSR approaches, often linked directly to the specific nature of the business, such as providing fairer working conditions (Singh and Agarwal, 2013) and focusing on environmental protection, for example, the reduction of Greenhouse Gas Emissions, reduction of water consumption, using "green" electricity just to name a few. The companies different CSR programs are developed in response to their customers' demands to differentiate themselves from their competitors, to maintain current customers and to attract new ones (Kiessling et al., 2016), besides living up to other stakeholder requirements and policies.

2.2 CSR concepts in the literature

The approach of companies to CSR has improved over the course of recent decades. Several concepts have been developed and it is widely accepted that companies have responsibilities beyond making profit (Crane and Matten, 2015).

One of the most accepted and established models is Carroll's (1979) "Four part model of social responsibility". This is a layer concept, which suggests that corporations have four responsibilities associated with being good corporate citizen: (1) economic – the company shall strive to make a profit; (2) legal – the company shall obey the law; (3) ethical – the company shall apply ethical considerations in corporate decision making; (4) philanthropic – the company shall be a good corporate citizen (Carroll, 1991). The model is built as a pyramid and the economic perspective is defined as the first layer. The economic responsibility is required of all corporations (Carroll, 1991) and includes return on investment for shareholders, safe and fairly paid jobs for employees, and customer demand to receive good quality products at a fair price. The legal responsibility describes the company's responsibility to abide by the law, the codification of society's moral views. The ethical responsibility obliges companies to do what is right, just and fair without the need for a legal framework. The philanthropic responsibility is desired but not expected of companies and includes activities for local communities, charitable donations and activities for employees. There are two main criticism which apply to this model: (1) the first two stages are not seen as a contribution to CSR in more recent literature; *and* (2) all four CSR objectives should be addressed and achieved in parallel and not following the pyramid principle (Ingenhodd and Sommer, 2011). Considering CO$_2$ emission reduction, which is part of ethical responsibility, the challenge is that if the approach follows Carroll's model, CO$_2$ emission reduction will only be considered once the economic and legal responsibilities have been achieved; this places lesser significance on ethical responsibility. Another critical point is that CO$_2$ emission reduction could conflict with, for example, economic goals, which means that it could be necessary to invest in new technologies in order to attain CO$_2$ emission reduction; this would reduce the economic responsibility of the company.

The most common understanding of sustainable development was defined by the World Commission on Environment and Development in 1987 as "development that meets the needs of the present without compromising the ability for future generations to meet their own needs". Sustainability was for a long time synonymous with environmental sustainability, but has been

broadened to include economic and societal considerations (Elkington, 1998). Based on this, Elkington (1998) defined the Triple Bottom Line (TBL) for businesses, which combines the three complimenting businesses components – economic, social and environmental – and defines them as the sustainability goal.

The economic perspective, on the one hand, includes business growth driven by the development, production and marketing of products that secure the long-term economic performance of a company and, on the other hand, considers the economic frameworks of national and regional requirements.

The social perspective includes a concern for a just and equitable world – locally, regionally, and globally. All goals manifested in the UN's eight Millennium Development Goals 2015, which currently form part of the 17 Sustainability Development Goals (SDGs), are relevant for the private sector due to the interdependent global economy. The social perspective also includes ensuring environmental sustainability (United Nations, 2017).

The environmental perspective describes the effective management of physical resources to secure the availability of these resources for future generations. Damaging pollutants, such as greenhouse gases from industrial production and consumer products, impact on biodiversity, and the effect of ongoing usage of non-renewable energy resources should be considered here. The goal is to provide future generations with an acceptable standard of living through the ongoing development of production and consumption.

Environmental sustainability has, for many years, been the most well-known and discussed goal in relation to sustainability and is attracting a significant amount of attention in the market. Increasing prosperity, combined with increasing levels of consumption, and ongoing population growth present a challenge to environmental sustainability; these factors are driving the demand for all kinds of products – from basic needs to luxury goods.

Both models – "The four part model" and the "Triple Bottom Line Approach" – include the environmental, social and economic perspectives, however, they mainly vary in their approach to CSR. Carroll's (1991) model focuses on the successive execution of the different steps starting with the economic perspective, followed by the regulatory, social and philanthropic. Moreover, the environmental perspective forms part of the social activities category. For Elkingon (1998) the three perspectives – economic, social, environmental – carry the same level

of importance and the environmental perspective is named as a stand-alone perspective, which gives it a stronger and clear focus.

The focus of this research is the environmental sustainability of the dairy industry, which is challenging given the environmental impact of the production process – from farm to table – and the need to serve the daily nutritional needs of a growing population.

In the following section we will focus on CO_2 emissions, policy and company engagement.

2.3 GHG/CO_2 emission and environment policy

With the Kyoto Protocol in 1997, the heated debate around CO_2 emissions became an urgent priority of global environmental policy. Green House Gas Emissions (GHG) are in accordance with the Paris Agreement the major anthropogenic greenhouse gases, namely: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O) and three groups of fluorinated gases sulfur hexafluoride (SF_6), hydrofluorocarbons (HFCs), and perfluorocarbons (PFCs). The defined GHG emissions were set to be reduced by 5.2% compared to the recorded level in 1990. In the Doha Amendment for development between 2012 and 2020, the EU committed to a further reduction of up to 30% compared to the 1990 level. This aim can only be achieved with the support of the energy sector and GHG policies containing new emission reduction measures (Antanasijević et al., 2015). In the Paris Agreement in 2015, the EU further strengthened its environmental objectives with the clear goal to achieve climate neutrality by 2050. To reach this ambitious goal two steps were implemented. In 2020, the plan was to cut 20% of GHG emissions, generate 20% of EU energy from renewable resources and improve energy efficiency by 20% - this was known as 20-20-20 goal. For 2030, the target is to cut at least 40% of GHG emissions, generate 32% of EU energy from renewable resources and improve energy efficiency by 32.5%. These goals were reviewed in 2021 and the "Fit for 55" program is proposed which aims to establish an intermediate step to reduce GHG emissions by at least 55% by 2030 compared to the 1990 levels. The package includes a set of changes to the existing policies and measures, for example an increase of the target of renewable energy production to 40% by 2030 and an update of the energy efficiency target of each Member State to 36-39% by 2030 (UNSDSN, 2021). The approval by the European Parliament and the Council is still needed.

Over the course of recent decades, many companies have contributed to tremendous economic growth and societal prosperity in many parts of the world. Despite this positive effect, associated development has gone hand in hand with negative effects on global climate, biodiversity, water and air quality, working conditions. It has also created new societal and environmental problems, such as child-labour, and exploitation of natural resources in developing countries (Kapecki, 2020, Pearson, 1987; Eskeland and Harrison, 2003; Mani and Wheeler, 1998; Neumayer and De Soysa, 2005; Edmonds and Pavcnik, 2006). Today, companies are expected to undertake efforts to alleviate the environmental and social impacts of their corporate operations. With regard to environmental change, companies are seen as agents of positive environmental change through developing green technologies, introducing environmental management systems and promoting environmentally friendly practices in their supply chain to decrease the negative environmental effect. According to Porter and Kramer's (2011) shared value approach, businesses should consider the most important customer needs. They should have a wider influence on society instead of only focusing on narrowly perceived value creation and short-term financial performance. This introduced a change to the shared value approach, which focused on the transformation of social and environmental problem into business opportunities.

Over the years, growing attention has been paid to the ethical, environmental and social dimensions of business, most often under the heading of corporate social responsibility (CSR). Multinational companies face growing pressure to account for social, environmental and ethical problems occurring in various locations of operation, often dealing with different norms and standards.

Companies engage in CSR based on three main motives. First, the economic perspective, where companies use CSR to attempt to obtain financial benefits or to enhance their competitiveness (e.g.. Mc Williams et al., 2006; Tang et al., 2012). Second, the institutional perspective where CSR involvement is driven by external demands, such as shareholder expectations (Mitchell et al., 1997, Oeberseder et al., 2013; Colucci et al., 2020) and engaging in activities that are considered socially acceptable and legitimate (Campbell, 2007; Chiu and Sharfman, 2011; Foster, J., 2021). Third, the ethical perspective which argues that CSR behaviour can be explained through moral considerations (Donaldson and Dunfee, 1994; Manuel and Herron, 2020). This research considers the institutional perspective. It focuses on improving understanding around how consumers perceive the CSR activities of dairy companies with

respect to CO_2 emission reduction and whether or how they incorporate this consideration into their everyday purchase decisions. The objective of this research goes hand in hand with the possibility for companies to enhance their competitiveness, thereby supporting the economic perspective as well.

However, the wider perspective of CO_2 emission reduction and the problems caused by CO_2 emissions within the dairy industry makes it necessary to put the CSR activities of dairy companies into a broader context. In the next section we further the understanding of the impact of the dairy industry on the environment and the responsibility of the dairy companies to contribute to the CO_2 emission reduction.

2.4 Dairy industry and CO_2 emissions

The dairy industry, dairy farmers and manufacturers produce highly nutritious food. The sector is driven by the demand of a growing population and the requirement to produce food products in a sustainable and environmentally friendly way. Dairy farmers are also directly affected by climate change and feel the need to act quickly on the environmental challenges, including the CO_2 emissions. Different initiatives, such as the Dairy Sustainability Framework (DSF), are seeking ways to reduce GHG emissions within the industry and analysis undertaken by the UN (FAO) provides the required focus on where companies should focus their efforts.

Over recent years, the industry has shown an impressive contribution to climate change. From 2005 to 2015 global milk production has increased by 30%. The main increase was in low- and mid-income regions, whereas milk production in Europe and North America only increased by 1.5%. Although milk production increased by 30%, GHG emissions within the dairy sector only increased by 18%, and the emission intensity by only 11%, measured from 2.8 to 2.5 kg CO_2 eq./kg FPCM (fat and protein corrected milk). This is due to more efficient dairy farming, productivity per animal, increasing farm management efficiency, and increased feed efficiency (FAO, 2015).

The focus of this research is Greenhouse Gas Emissions, especially CO_2 emissions caused by the dairy industry in Europe. Since 1990, the total level of GHG emissions in Europe has been reduced by 18% (European Commission, 2015). The main contributor of this reduction is emissions reduction of waste management and industrial processes, as well as the energy and

agricultural sectors. The European agriculture sector has reduced emissions by 23% over the past 30 years (European Commission, 2015). To support the sustainability agenda further, the European Common Agriculture Policy (CAP) has established a payment to farmers for using their farmland in a more sustainable way and for caring for natural resources, including diversifying crops, maintaining permanent grassland and dedicating 5% of farmland to ecologically beneficial elements. Permanent grassland can extract carbon from the atmosphere and store it in the soil, mitigating CO$_2$ emissions. This payment system for farming aims to counterbalance the challenges associated with not safeguarding biodiversity in farming sector (European Commission, 2017).

Any form of food production has an impact on the climate through the emissions of greenhouse gases. According to the Life Cycle Assessment method, the livestock sector accounts for 14.5% of all human-induced emissions globally, ruminants account for 10%. When considering associated milk and meat production, the sector accounts for 4% of global emissions and milk production emits 2.9% (FAO, 2013). However, CO$_2$ emissions only form one sustainability aspect of the dairy sector. The contribution to healthy and nutritious diets, biodiversity, contribution to feeding an ever-growing population, clean water, and economic growth are other factors to be considered.

The dairy industry has committed itself to reducing its impact on climate change and contributing to feeding the expanding global population. With this commitment, the dairy industry is following the CSR approach of Elkington (1998) by trying to balance the different perspectives of economic growth and social and environmental challenges, which may require the sacrifice of certain economic benefits to improve social and environmental problems. As stakeholders, consumers play an important role in enabling a company to be more sustainable. If companies can affect consumer purchase intention and behaviour, this will lead to developments in accordance with CSR goals. Companies may be able to invest more in sustainable activities, thereby strengthening their impact. This, in turn, will lead more companies which have not yet established a CSR strategy to change their approach to stay competitive in the market.

The following section will focus on the influence of CSR on consumer purchase intention with a view to developing a better understanding of how consumers act when buying low involvement products, such as dairy products, and how CSR can be integrated in this decision

process. This will enable companies to better understand how to include consumer purchase intention building into their strategic CSR approach and will help the industry to deliver on the targets set for the industry and those set for CO$_2$ emission reduction in general.

2.5 CSR and consumer purchase intention

The consumer purchase decision making process is described, in the marketing literature, as a process through which: (1) consumers identify their needs, (2) collect information, (3) evaluate alternatives, (4) make the purchase decision, *and* (5) evaluate the purchase (Kotler, 1997). These actions are determined by psychological and economic factors, and are influenced by environmental factors such as cultural, group, and social values (Kotler, 1997). The decision process can change depending on the kind of product the consumers are going to buy – depending on the involvement of the consumer a distinction can be made between habitual/routine decision making, limited decision making and extended decision making. For example, groceries, newspapers *etc.* fall into the first category, clothing, gifts, home furnishings, vacations *etc.* into the second, and buying a house, deciding on a school *etc* into the last category (Kotler and Keller, 2006).

There are numerous studies available dealing with consumer purchase decisions and the integration of CSR topics in the purchase decision process. CSR has shown a positive effect on purchase behaviour. Findings suggest that CSR is an antecedent for customer satisfaction (Fornell, 1992, Xie et al., 2017). Customer satisfaction results in higher customer loyalty (Bolton and Drew, 1991), a willingness to pay higher prices (Homburg et al., 2005), positive word of mouth (Szymanski and Henard, 2001) and general higher satisfaction with the company (Lee and Heo, 2009). Other research found that CSR is part of the corporate association and has shown an indirect effect on purchase intention through the mediating effect of trust and effective identification and is used in the evaluation of the company and its products (Lin et al., 2011; Hur and Kim, 2020). Looking at CSR activities and consumers personal values shows that consumers receive a "good feeling" about contributing to a social or altruistic action. They see it as a silver lining to their sacrifices – for example, in paying a higher price for sustainable production or being helpful to others (Smith, 2003; Mohr and Webb, 2005). In other research, it is suggested that consumers are not willing to compromise CSR with the main attributes of the product like price or quality (Mohr and Webb, 2005; Gupta and Hodges, 2012). Consumers

are also found to be more sensitive to unethical, rather than ethical behaviour, which means that doing 'bad' receives more attention and damages the company more (Brown and Dacin, 1997; Marin and Ruiz, 2007; Sen and Bhattacharya, 2001). All in all, the majority of the studies show a direct or indirect effect of CSR activities on the consumer purchase intention.

Another research stream shows that knowledge about CSR activities is a strong predictor of consumer behaviour (Wigley, 2008), but it is often difficult to retrieve and store relevant information about products and the different companies offering these. Earlier studies have suggested that consumer awareness of company CSR activities have been low (*e.g.* Pomering and Dolincar. 2008; Hartmann et al., 2013)) and a low awareness does not activate the consideration of CSR characteristics in the purchasing decision process. This is a limiting factor with respect to positive consumer response to CSR activities (Mohr et al., 2001).

Other studies like Chen and Chang (2013) focus on the effect of greenwashing – dishonest and misleading claim of company's products or services as being green, environmental friendly, or sustainable while they are not (Parguel et al., 2011) – revealing that greenwashing negatively influences green trust and often results in suspicion and scepticism about green claims. Newer research indicates that greenwashing has an effect on green purchase intention and that this mechanism is activated through green scepticism. With the increasing awareness of environmental benefits consumers are becoming increasingly critical when evaluating food companies' environmentally sustainable practices (Nguyen et al., 2019).

It is interesting how the consumer decision for low involvement products, such as dairy products, is affected by adding CSR characteristics. In general, the consumer's involvement in purchase of everyday products is low but can be elevated through situational and enduring factors (e.g., Richins et al., 1992, Thøgersen et al., 2012). Situational factors reflect temporary feelings of involvement in a particular situation and enduring factors stand for general and long-term concern with a product. Adding new features to everyday products is expected by marketers to improve the consumers' interest and involvement (Kotler, 1997). Ethical or environmental characteristics are examples of enduring factors and it is suggested that, added to the product, they can lead to a change in consumer purchase decision making (Payne et al., 1990).

In this context, Thøgersen et al.'s (2012) findings are very interesting. In their research they found that even though consumers show higher involvement when CSR characteristics are added, decision making at the purchasing stage stays the same. It is concluded that the involvement is more directed towards the issue than the product itself (Thøgersen et al., 2012). Thøgersen et al. (2012) explain this purchase behaviour by stating that consumers have developed a routine in buying this kind of product and use simple and efficient choice heuristics, learned through past experience. Following these results, it can be argued that choosing environmentally friendly or ethical product alternatives requires a high involvement from consumers in protecting the environment and/or ethical issues in general (e.g. Vermeir and Verbeke, 2006). Time and effort of consumers at the purchasing stage can be minimized through the development of an easy process to identify environmentally friendly or ethical products and through establishing simple decision heuristics for satisfactory choices (Thøgersen et al., 2010); the decision process can still be defined as routine decision making (Kotler, 1997). One option is to use an eco-label. Thøgersen et al. (2010) examined the consumer response to eco-labels and found that success depends on latent consumer demand for environmentally friendly products, their experience with using other eco-labelled products, and their trust in the endorsing organization. This means that a routine decision supported by eco-labels needs to fulfil some preconditions before the adaption process can be successful.

Thøgersen et al.'s (2012) findings are directed towards organic milk purchases in Denmark. Consumer decisions around organic food products are often driven by personal interests, like health (Hughner et al, 2007). When it comes to research around CO$_2$ emission reduction in the production process, social and altruistic characteristics and their impact on consumers' purchase decision making process are in focus, rather than personal interests. Therefore, this research will add to Thøgersen et al.'s (2012) findings. Moreover, Denmark is known as the country with the highest penetration of organic milk in Europe (32%) (EU, 2019); it is more available than conventional milk across all the different sales channels. There is a clear focus on fresh milk in Denmark, which is very different from other markets. This research chooses to focus on the German market, a market where the share of organic dairy products is high compared to other European countries, but lower than in Denmark.

The question examined in this research is whether the consumers' involvement in dairy product purchase decision making can be increased when CSR characteristics like CO$_2$ emission reduction form part of product communication. Does the choice of environmentally friendly dairy products require a high involvement from consumers in protecting the environment in general or is a change in the purchase decision process necessary? Looking at the literature, the researcher did not come across a publication focussing on consumer decision for daily low involvement consumer products where CO$_2$ emission reduction is added to product communication.

In the next chapter, we will focus on sustainable diets and consumer behaviour.

Chapter 3: Environmental Concern and Consumer Behaviour

3.1　Introduction

The earth's environment has undergone major destructive changes, depletion of natural resources, damage to ozone layers, and loss of agricultural land. Humans are increasingly influencing the climate and the earth's temperature, mainly through the burning fossil fuels, deforestation, farming livestock, using fertilizers with a high nitrogen content, and emitting fluorinated gases. These human actions lead to huge amounts of greenhouse gases being emitted into the atmosphere, increasing the greenhouse effect and global warming.

Measurements show that 2011-2020 was the warmest decade on record, with the global average temperature in 2019 reaching 1.1°C above pre-industrial levels. Human induced global warming is currently increasing as a rate of 0.2°C. A critical temperature increase of 2°C above pre-industrial levels will have serious negative impacts on the natural environment, as well as human health and wellbeing. Therefore, the international community has recognized that global warming cannot exceed 2°C and has set a clear goal to limit it to 1.5°C (EU, 2021). Scientific studies indicate that extreme weather conditions, such as heat waves, large storms, floods and droughts, will become more frequent and have major effects on the global population and economies.

Traditionally, developed countries have relied on technological innovations to resolve the above mentioned problems, rather than changing their behavioural patterns and lifestyle choices. Some technological and managerial solutions have been employed in the food business to reduce GHG emissions, including improving carbon removals by repairing degraded lands, optimising fertiliser use, and increasing production capacity per unit of emissions created. It had become evident that improving technology methods alone would not be sufficient to achieve the necessary reductions in GHG emissions, because population increase and the consumption of high-energy foods might sabotage the reductions obtained via technological and managerial innovation (Yang et al., 2019).

It is obvious that a good starting point would be developed countries, where technological innovations and the consumer behaviour can work together to resolve these problems, thereby leading to the best possible result.

3.2   European consumers and climate change

A new Eurobarometer published in 2021 clearly shows that the majority (93%) of Europeans believe that climate change is a serious problem; this includes 78% who see it as a very serious problem and 15% who view it as a fairly serious problem (Special Eurobarometer, 2021). These figures have remained largely the same since 2019. At least 25% of EU Member States consider climate change to be the most serious problem facing the world; in Germany, it is the most discussed issue. Following the EU report, almost all Europeans have taken environmentally friendly action, although they do not believe that they ought to bear the main responsibility for tackling climate change. The most common action is trying to reduce waste and regularly separating it for recycling (75%). Another less common action is trying to cut down on the consumption of disposable items whenever possible (59%). Interestingly, respondents said that they are likely to change their dietary habits through, for example, increased purchase of organic food and eating less meat. 90% of the respondents agreed that greenhouse gas emissions should be reduced to a minimum and that any remaining emissions should be offset in order to make the EU economy climate-neutral by 2050. Respondents expect more robust action from their national governments and the European Union.

These numbers are quite interesting and show a clear awareness amongst European consumers of the climate change problem. However, it also highlights that these consumers do not place the main responsibility for tackling climate change on themselves. These figures mean that an increased focus on green consumerism is paramount, as is the need to activate the contribution of consumers to making a difference and supporting the achievement of the climate goals.

The next section focuses on environmental awareness and its effect on purchase decisions.

3.3   Environmental awareness and purchase decision

Environmental awareness and its impact on purchase decisions is growing and there are an increasing number of "green products" appearing on the market. "Green products" are products which are produced, used and disposed of under the principle of sustainable development (Maichun et al., 2016), or are produced to protect the environment by conserving natural resources and reducing waste production, toxic agents or pollutants (Ottman et al., 2006). The literature uses different expressions for environmental purchase decisions, which have slightly different meanings. Most commonly used are expressions like green purchase behaviour, green

product purchase decisions, green consumption and green consumerism. Green purchase behaviour can be described as the purchase of eco-friendly products to reduce consumers' environmental footprint (Barbarossa and DePelsmacker, 2014). Green product purchase decisions, as referred to in Moser (2015), constitute environmentally sustainable purchasing decisions in everyday buyer behaviour, which reduce their environmental impact by substituting higher impact products with environmentally friendlier versions. Green consumption can be defined as healthy consumer food choices, which are produced in an environmentally friendly way and are in accordance with socially ethical standards (Macdiamid et al., 2012; Zander & Hamm, 2010). Green consumerism stands for behaviour from consumers who consciously seek to purchase green products and minimize the negative impact of their actions on the natural world, *i.e.* reduce pollution, minimize use of energy and resources, and use recyclable packaging (Samarasinghe, 2012).

For every day products like groceries, the consumers usually spend little time and effort and use simplified choice heuristics like buying a trusted brand, choosing the products with the lowest price or repeating a previous satisfactory choice. Adding new features like environmental or ethical characteristics is expected to elevate the consumers involvement in these products (*e.g.*, Kotler, 1997). Time and effort of the consumers can still be minimized by easy identification of the pro-environmental or ethic products establishing easy choice heuristics (Thøgersen et al., 2010) and therewith the decision process can still be defined as routine decision making (Kotler, 1997).

This research focuses on consumer green purchase behaviour in the context of CO_2 emission reduction in the production process of dairy products. CO_2 emissions across the whole production process are considered – from farm to shelf. The main question which this research seeks to address is whether consumers take CO_2 emission reduction into consideration when deciding to opt for low involvement products, such as dairy products. In other words, does a dairy company's sustainable approach, focused on CO_2 emission reduction, play a role in the customer's decision making process when purchasing dairy products? Do consumers seek to substitute dairy products produced in a conventional way with those from a company, which has established a sustainable production approach throughout its supply chain?

Just as CO_2 emission reduction is an important topic for all industries, it is also relevant for the dairy industry. Dairy companies are increasingly under pressure regarding the CO_2 emissions of their products. Main contribution to CO_2 emission of the industry is centred around the production process and communicating it in CSR reports. However, when conducting the literature review, the researcher did not notice research evaluating the impact of CO_2 emission reduction on consumer decision making when purchasing low involvement products, especially dairy products. Some dairy companies try to assure their consumers that the products are produced and delivered in the best possible, environmentally friendly way and try to compensate for steps in the production process, where full optimization is not yet achievable. For example, Arla amba, a leading dairy company that aims to achieve Carbon Net Zero by 2050, has launched milk in the Danish and German market, which clearly states that Arla either compensates for its CO_2 emissions resulting from the production process or uses "…milk from some of the most climate efficient dairy farms in the world". This illustrates that some information is available to the consumer; however, it is not clear how consumers evaluate this information.

With the increasing concern for the environment, especially related to global warming, consumers are starting to translate their environmental consciousness into a commitment to purchase environmentally friendly or green products, products which contribute to the conservation of the natural environment (*e.g.* reduction of CO_2 emissions), or are reusable or recyclable (Mostafa, 2007). Several studies have been conducted, mostly applying the Theory of Reasoned Action (TRA) and the Theory of Planned Behaviour (TPB). In these studies, it has been suggested that purchase intention can describe purchasing behaviour (Chan, 2001; Maichun et al., 2016, Soyez, 2012). More specifically, green purchase intention has been described as the motivation of consumers to exert efforts in realizing green purchasing behaviour (Chan, 2001; Lee et al., 2015). Other research streams consider the importance of human values in guiding attitudes and behaviours like the Norm Activation Model and the Value-Belief-Norm framework in the pro-environmental context. Values are abstract ideas, such as sustainability which contribute to consumer decision making capabilities, framing consumers attitudes and leading consumers to engage in associated behaviours (Schwartz and Bilsky, 1987). Studies including human values have increased the understanding for pro-environmental decisions like organic menu choice (*e.g*., Shin et al., 2018), electricity savings (*e.g.,* Zhang et al., 2013).

Consumers have increasingly shown concern about the effect of their daily activities on the environment (Liu et al., 2017). Labels are one possibility to guide the consumers to make more sustainable choices. One well-known example is the Carbon-Footprint (CF) labelling, measuring the total emission of carbon dioxide caused by particular product throughout its lifecycle (Thøgersen and Nielsen, 2016). Even though CF has already been developed in 2007, consumers still have a limited understanding of CF labels as recent research shows (Rodoni and Grasso, 2021). In Germany the food industry and environment NGOs – German Zero and Global Impact Alliance – have started a new initiative "Together for Carbon Labelling". The motivation of the group is to help consumers make environmental friendly decisions about the food products they buy. It is discussed in the German market, that this may be more a PR activity of some of the private companies due to the fact that the German government is planning to support the EUs regulatory plans to create a label that aims to combine organic, regional, animal welfare and Nutriscore labelling system that already exists (Fairplanet, 2021)

For individuals who are motivated to contribute to sustainable development and especially environmental protection, everyday consumption is a good starting point. The figures 3.1, 3.2 and 3.3 reveal the importance of the different food types and sources. Food and agriculture accounts for 26% of global greenhouse gas emissions and the food part consists of land use (24%), crop production (27%), livestock and fisheries (31%) and supply chain (18%) (*see* Figure 3.2). Looking at the carbon footprint of diets across the European Union, dairy accounts for 27% of GHGs in Europe and therewith the second largest part behind meat and eggs (*see* Figure 3.3). Considering the emission by source, methane from cattle play with 22% an important role besides land-use change (30%) with 70% of these emission from animal feed (*see* Figure 3.3). The increasing focus on CO_2 emission reduction in the food industry and the availability of more sustainable products provide consumers with the option to substitute existing products with products that are more environmentally friendly.
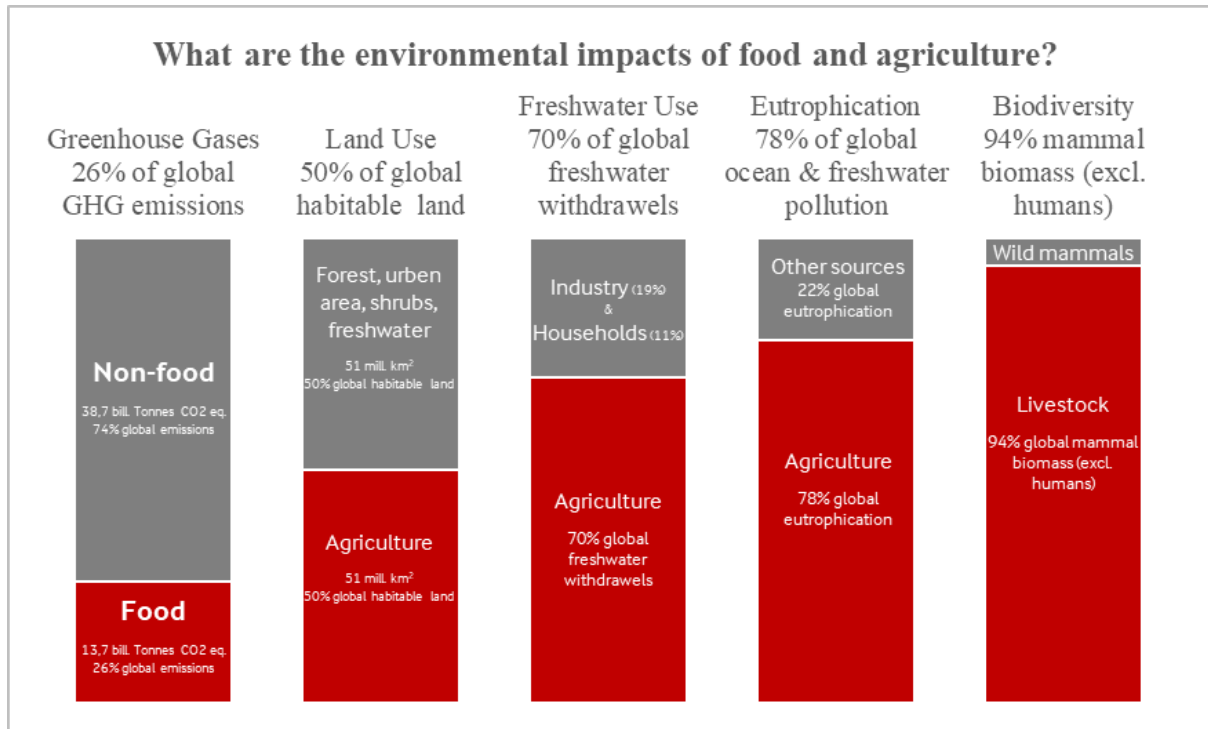
Figure 3.1 Environmental impacts of food and agriculture (Poore and Nemeck, 2018; Bar-On et al., 2018; UN FAQ, UN Aquastat) (https://ourworldindata.org/environmental-impacts-of-food)

Figure 3.2 Global greenhouse gas emissions from food production (Poore and Nemeck, 2018; Bar-On et al., 2018; UN FAOUN, UN Aquastat) (https://ourworldindata.org/environmental-impacts-of-food

Carbon footprint of diets across the European Union: by food types and source

by food type

by source

Veg oils & seeds — 4%
Drinks, stimulants — 3.5%
Cereals — 4%
Fruit, veg & nuts — 4%
Roots — 1.5%

Meat & Eggs — 56%

Dairy — 27%

70% of LUC emissions from animal feed

Food choice plays much stronger role than where food is sourced

83% of emission from dairy, meat and eggs

Land-use change — 30%
Transport — 6%
Methane from cattle — 22%
Manure management — 22%
Manure left on pasture — 2%
Rice cultivation
Organic nitrogen fertilizer — 3%
Synthetic nitrogen fertilizer — 14%

Figure 3.3 Carbon footprint of diets across EU (Sandström et al., (2018)
(https://ourworldindata.org/environmental-impacts-of-food)

To increase the purchase of food produced under the commitment of CO2 emission reduction, consumers need to be aware of the carbon footprint of the food products they are buying. In Germany the food brands Oatly, Frosta, Mymuesli and Nestlé Germany together with other supporting partners have found the program "together for carbon labelling" with the goal to establish CO_2-Transparenz in the food industry by developing a tool to inform consumers about the impact of their food production (TCL, 2021). A literature review conducted by Rondoni and Grasso (2021) showed that the knowledge of carbon footprint labelling is limited and the food product itself is influencing the consumer behaviour towards the carbon footprint labelling. In an experiment conducted by Eloffson et al. (2016) they found that signs in a supermarket with qualitative information about the carbon impact increase the demand for climate-certified milk by approximately 6-8%, but did not show a significant impact on total milk sales. A study on

CF labled dairy products conducted in Italy indicate a possible interest of consumers in CF labels and may be ready to pay a higher price, if they believe that buying the products with less environmental impact can combat climate change (Canavari and Coderoni, 2020).

The next section provides an overview of the theoretical model used in the context of pro-environmental consumer decision making.

3.4 Theoretical models and pro-environmental consumer decision making

Research on pro-environmental behaviour has been conducted since the 1970s using various theoretical frameworks, including Theory of Reasoned Action (Fishbein and Ajzen, 1975), Theory of Planned Behaviour (Ajzen, 1991), extended approaches of both models, and the Norm Activation Model (Schwartz, 1970). The choice between these different frameworks has mainly been driven by consumer motives, *i.e.* whether the consumer is motivated by self-interest or social aspects (Bamberg et al., 2007). The Theory of Reasoned Action (Fishbein and Ajzen, 1975) and the Theory of Planned Behaviour (1991) are often applied when pro-environmental behaviour is considered as self-interest; whereas the Norm Activation Model is used when this behaviour is considered pro-social (Bamberg et al., 2007; Bamberg and Moser, 2007).

Various research approaches concerning green purchase decisions have established a positive relationship between attitude, behavioural intention and behaviour. This extends to studies within the green hotel context (Han and Yoon, 2015; Teng et al., 2014; Chen and Tung, 2014; Chen and Peng, 2012; Han et al., 2011; Han and Kim, 2010; Han et al., 2010, 2009), organic food choice (Dean et al., 2012; Ha and Janda, 2012; Zhou et al., 2013; Arvola, 2007), recycling (Davis et al., 2006), energy saving (Chen, 2016), waste management (Graham-Rowe et al., 2016), amongst other areas.

The Theory of Reasoned Action (Fishbein and Ajzen, 1975) has been used as a basis for research around high involvement purchase decisions, such as the purchase of an electric car (Nosi et al., 2017) or choosing energy efficient products (Ha and Janda, 2012). In the context of pro-environmental behaviour, consumers often opt for behaviour motivated by desirable output (Bang et al., 2000). One example a desirable output of this behaviour would be a positive effect on climate issues. Another driver is attitude. Attitude can be influenced by evaluative

judgements and leads to the intention to perform the behaviour. Nosi et al. (2017) found, that attitude has the strongest impact on intention to purchase an electric car and recommended that companies develop and/or place an emphasis on communications which highlight any positive aspects associated with electric cars. Ha and Janda (2012) extended the TRA approach by including knowledge and beliefs related to the energy-efficient products, confidence of consequences, environmental awareness, and eagerness of environmental engagement. Their research showed that attitude has a stronger impact on purchase intention than subjective norms when consumers make a decision on energy efficient products. In order to have a greater impact on behaviour, they recommended that companies should utilize communications, which clearly indicate the positive consequences of energy saving products on the environment.

Other studies in the pro-environmental context have applied the TPB. Both theories, the TRA and TPB assume that the individual is rational and makes systematic use of the information available. The main difference between the two frameworks is that the TRA considers that behaviour is under total volitational control of the individual, whereas the TPB adds perceived behavioural control as a volitional constraints factor that determines the behavioural intention (Madden et al., 1992). This belief factor includes the possession of requisite resources and opportunities to perform the behaviour in question (Madden et al., 1992).

The TPB has been successfully applied in different pro-environmental contexts; for example, hospitality and tourism (Han et al., 2010; Teng et al., 2015; Kim et al., 2013; Han et al., 2017), energy saving (*e.g.,* Chen, 2016; Gao et al., 2017), recycling (*e.g.,* Davis et al., 2006; Aboelmaged, 2021), waste prevention (*e.g.,* Graham-Rowe et al.,2016), consumption behaviour of sustainable and organic food (*e.g.,* Arvola et al., 2008; Vermeir and Vebecke, 2008; Thøgersen, 2007) and genetically modified foods (O'Fallon et al., 2007). Its application has shown various results across different behaviours and contexts (Ajzen, 1991).

Han et al. (2010) favoured the Theory of Planned Behaviour to examine customers' intention to visit a green hotel. The reason for Han et al. (2010) to apply the TPB in this context was that the choice of a green hotel may not be completely self-imposed. The decision to opt for a specific hotel could, for example, depend on price, reason for travel (*e.g.* company strategy may impact the hotel of choice if the reason for travel is business), and location. The volitional constraint factor diminishes the customer's ability to make an environmentally friendly decision. The results showed that the TPB had a strong predictive power on consumer purchase intention

and illustrated that this framework provides a solid theoretical basis for research on pro-environmental hotel choices (Han et al., 2010).

In the context of energy saving Gao et al. (2017) and Chen et al. (2016) extended the TPB. Gao et al. (2017) used descriptive norms to extend the TPB. Individuals' attitudes toward energy conservation, perceived behaviour control, descriptive norm, and personal moral norm all positively influence individuals' energy conservation intentions in the workplace, whereas subjective norm showed no effect. Chen et al.'s (2016) results indicate, that attitude, subjective norm, one's moral obligation and climate change play a significant role in predicting consumers' intention in energy saving to mitigate climate change.

Davis et al. (2006) applied the TPB in a study on recycling. They found that recycling behaviour is mainly influenced by concern for future generations, the need to bury less waste in landfill, and the fact that recycling saves resources and protects the environment. Their research showed that in this scenario, attitude did not have a significant effect on intention. The outcome of the recycling engagement and the reason or willingness to achieve this were the key drivers. An active concern for the environment was also identified as a main driver for pro-recycling attitudes and behaviour (Davis et al., 2006). The intention to recycle was significantly influenced by having the appropriate opportunity to recycle, knowledge about the recycling schedule, the health of the community, and the consequences and output of recycling (*e.g.* the protection of the nature). According to Aboelmaged (2021), attitude is a strong predictor for e-waste recycling intention of young adults, while subjective norms and behavioural control show no significant influence.

Graham-Rowe et al. (2016) researched the reduction of household fruit and vegetable waste and applied the TPB model. They found that participants who felt favourable towards the reduction of their household waste, who felt that the people around them supported their pro-environmental behaviour, and who felt confident in their ability to reduce their household waste, were more likely to have the intention to reduce their fruit and vegetable household waste. A more positive attitude, a more positive subjective norm, and a greater level of behavioural control were associated with an increase in the positive intention to reduce household waste.

Chen (2016) found that integrating moral obligations into the TPB model showed a better explanatory power than the original TPB approach in predicting the intention of individuals to engage in energy saving and carbon reduction behaviour in order to mitigate global climate change. It is argued that personal feelings of moral obligation and responsibility to perform or

to refuse to perform a certain behaviour can have a significant impact on the prediction of an individual's intention to act in a moral manner (Beck and Ajzen, 1991; Leonard et al., 2004). When researching organic food consumption, Arvola et al. (2007) showed that attitude, subjective norms and behavioural control had a considerable impact on purchase intention. Arvola et al. (2007) added affective and moral influences to attitude and behaviour. They found that this combined approach provided a better prediction of behaviour than only considering the cognitive components (Bagozzi and Burnkrant, 1979, Normann, 1975). In their study, Arvola et al. (2007) included a positive measure for moral attitude, which was linked to the positive feeling of living up to one's own moral principles and 'doing the right thing'. As a result, the affective and moral measures were found to play a considerable role in predicting intention to purchase organic food. Furthermore, the results suggests that moral norms are partially mediated through attitude and partially have a direct effect on intention. Other authors, such as Thøgersen (2007), successfully included moral attitudes as part of the attitude concept, instead of measuring it as a separate construct, when researching organic food purchase decisions. Verma and Chandra (2018) focused their research on intention to visit a green hotel. In their study, attitude ranked highest even though moral reflectiveness and consciousness was added to the model. In the context of their research, it can be argued that the decision to stay in a green hotel was based on higher involvement and factors, including price and consumers understanding of the effect of their own behaviour, may have led to the differences in intention building. Yadav and Pathak (2016) considered environmental concerns and environmental knowledge when researching intention to buy green products. They found that environmental concerns have the highest direct impact on purchase intention and that environmental concerns and environmental knowledge show a significant effect on attitude. These results are in line with studies conducted by Harmann and Apaolaza (2012) and Mostafa (2007, 2009), who determined the importance of environmental concerns in the context of eco-friendly behaviour.

The above mentioned examples regarding different pro-environmental behaviours show that the TPB has been successfully applied for research with respect to different pro-environmental purchase decisions. However, there is still a widely acknowledged attitude-behaviour gap when researching pro-environmental behaviour, which raises the question whether consumers' intention driven by attitude, behavioural control and social norms are sufficient to explain consumer behaviour. Claudy et al. (2015) worked on the attitude-behaviour gap for renewable

energy by implementing reasons for and reasons against adoption of renewable energy into their model. The results suggest that both types of reasons provide additional explanatory power over other intention models like the TRA and TPB. A similar approach was chosen by Dhir et al. (2021) including facilitators and barriers towards engaging in e-waste recycling to close the gap.

Furthermore, pro-environmental consumer decisions are often driven not only by rational, but also by moral and ethical considerations. The normative considerations imply that people prioritize collective interests over their own self-interest. Several researchers integrated the moral perspective into their research based on the TPB, either as part of the attitude construct or as additional constructs. Adding a moral perspective to the research model is consistent with the approach of Ajzen and Fishbein (1980), who acknowledged early on that integrating moral norms or perceived moral obligation into the TRA can further strengthen the framework.

For the purposes of the research question, which is centred around consumer consideration of CO_2 emission reduction when purchasing dairy products, integrating the moral perspective is considered very important. There are two main "reasons for" this: (1) CO_2 emission reduction is a clearly altruistic topic which requires some consumer consideration before it can be integrated into the purchase decision. A better understanding of the drivers behind this consideration is important, especially in the context of purchasing low involvement products, such as dairy products, where, to the best of the researcher's knowledge, only limited research is available. (2) It is considered that consumers do not place CO_2 emissions in the dairy industry at the forefront of their purchase decision process, if they include it at all. In this context, it is important to develop a more detailed understanding of consumers' moral perspectives in order to attain valuable research results.

The Norm Activation Model (NAM) is frequently used to explain how and which normative considerations affect pro-environmental behaviour. Several researchers have added the moral perspective by integrating it with the TPB. Consumers tend to evaluate what is morally right or wrong with respect to the environment, meaning that pro-environmental behaviour can be classified in terms of moral, rather than economic, motivation(DeGroot and Steg, 2009).

As a theory, the Norm Activation Model is often used to systematically explain a person's attitude in supporting social and environmental behaviour (Shin et al., 2018; Park and Ha, 2014; Han 2015; Onwezen et al., 2013; Zhang et al., 2018) and has become a part of pro-environmental and empirical research (DeGroot and Steg, 2009).

The NAM is rooted in altruistic behaviour, which revolves around sacrificing a person's own interest for the well-being of others (Schwarz, 1977). Altruistic behaviour is a function of personal norms (PN), which are activated by awareness of consequences (AC) and ascription of responsibility (AR). Personal norms describe the self-expectation of an individual, originating from norms and values. Schwartz (1977) states that personal norms are a core component of the NAM model and are defined as a feeling of moral obligation to perform or refrain from specific actions. Personal norms differ from subjective norms. The former refers to feelings of one's own moral obligations based on personal values and acts as an intrinsic factor that encourages pro-environmental behaviour. In contrast, the latter is based on the normative influence of other people and acts as an extrinsic factor.

Another important point to consider when using the NAM to explain pro-environmental behaviour is that an individual's awareness of consequences and ascription of responsibility can be added to the model, which provides further insight into their personal norms and pro-environmental decision making. Awareness of consequences relates behaviour to the welfare of others and ascription of responsibility describes whether the individual feels responsible for the consequences of their behaviour (Schwarz, 1977).

The Norm Activation Model has been successfully applied in predicting pro-environmental behaviour in different areas such as direct and indirect energy saving, transport, food, recycling, and environmental complaint behaviour (i.e. Bamberg et al., 2007; Gärling et al., 2003; van der Werff and Steg, 2015; Han et al., 2015; Zhang et al. 2018; Wang et al., 2019; Shin et al., 2018). In their study, Bamberg et al. (2007) concentrate on public transportation use, rather than car use, for daily trips, such as shopping or travelling to work. They found that awareness of environmental problems caused by one's own car use enhances feelings of guilt, resulting in an increased sense of obligation (personal norm) to use more environmentally friendly transportation means, such as public transportation. Results of research by Gärling et al. (2003) confirms that the intention to perform collective environmental behaviour depends on personal norms, awareness of consequences for others, the biosphere and oneself, and ascription of responsibility. Van der Werff and Steg (2015) predicted energy saving behaviours in three different domains, namely; transport, food, and energy use at home. Their research findings showed that the NAM can be used to predict the intention to reduce energy use in the different contexts – home energy use (showering), transportation (driving style), and food (meat

consumption) – which represent different domains contributing to total household energy use (Reinders et al., 2003). These energy consumption examples relate to direct, as opposed to indirect, energy consumption, which is directly linked to consumer behaviour (transportation and showering). Indirect energy usage is the energy used to produce, distribute, and dispose of a product (Reinders et al., 2003). It is a significant source of energy consumption and is less visible and tangible than direct energy consumption (Pedersen, 2003). Furthermore, the study found, that general conceptualization of the NAM appeared to be better at predicting a general intention to save energy across all three examples. Shin et al. (2018) found that, in the context of organic menu items, attitude is a stronger predictor than personal norms. This research argues that purchase intention for organic food is mainly driven by self-interest because organic food products are perceived as healthier. Moreover, studies confirm that, in the context of organic food, consumers consider that health is one of the most important factors (Rana and Paul, 2017).

In a study conducted on environmental lodging, Han et al. (2015) confirmed that the NAM is a sequential model and verified the role of moral obligation as an important predicting factor for behavioural intention and as mediator for the other study variables. The findings of Zhang et al. (2018) verify use of the NAM. They found personal norms to be the most influential predicting factor of the environmental complaint intention of Chinese citizens. Personal norms completely mediated the ascription of responsibility and partly mediated awareness of consequences. Awareness of consequences either influences personal norms directly or is mediated by ascribed responsibility and can activate moral obligation. Wang et al. (2019) conducted research on waste separation intention in China. In line with the NAM, this study showed that awareness of the negative consequences of not separating waste had a positive and significant correlation with ascription of responsibility. Awareness of consequences and ascription of responsibility also have a significant correlation with personal norms. All of the aforementioned studies support the NAM as a mediator or partial mediator model and show that it facilitates a significant increase in the prediction ability of behavioural intention in the pro-environmental context.

In summary, the NAM has proven to be a successful model when considering pro-environmental consumer behaviour. Research in this respect has mainly been conducted in the context of direct energy use and high involvement consumer decisions. However, Van der Werff and Steg's (2015) focus on energy usage related to meat consumption) shows that the NAM can also be successfully applied in the context of low involvement consumer decisions

and indirect energy usage. Even if consumers only have limited knowledge regarding indirect energy use, integration with the NAM improves the predictability of purchase behaviours. Based on this finding, this researcher has applied the NAM in the context of consumer intention to purchase dairy products produced with CO_2 emission reduction in mind.

In conjunction with adding moral norms to the NAM, this researcher evaluates the Behavioural Reasoning Theory (BRT). The BRT builds on the TPB and integrates context specific reasons. According to a systematic literature review of BRT (Kumar et al., 2020), there is evidence to show that BRT can explain a relatively higher variance in behavioural intention and behaviour than the TRA and TPB (i.e. Diddi et al., 2019; Ryan and Casidy, 2018; Claudy et al., 2015; Claudy et al., 2013). Most studies confirm the additional explanatory power of context specific reasons with respect to high involvement decisions, such as sustainable transportation, renewable energy systems, mobile banking, employee turnover, and relocation decisions (Peterson and Simkins, 2019; Diddi et al., 2019; Miralles et al., 2017; Claudy et al., 2013). Only one study was found concerning low involvement products, namely, organic food (Ryan and Casidy, 2018).

Claudy et al. (2013) researched renewable energy and found that "reasons for" and "reasons against" renewable energy use are strong antecedents of consumer attitudes and adoption intentions. In particular, reasons favouring adaption influence attitudes, which in turn influences intention. The study also shows that values influence attitudes indirectly through reasoning, which enables consumers to justify their decisions. It is argued that consumers use deeper cognitive processing to justify and support their decision to adopt renewable energy use as it appeals to consumers' green values. This is reinforced by providing detailed information and emphasizing the benefits around adopting renewable energy use. Applying the BRT helps to provide more detailed information to approach consumers and enforce the adoption decision. Claudy et al. (2015) contribute to innovation literature in three main ways. (1) Through the identification of salient factors and their relative influence on consumers' adoption decision. (2) Through the identification of salient "reasons for" and "reasons against" the consumers' adoption decision and the evaluation of their importance to be able to more effectively develop and generate market innovations. (3) They use the BRT to test additional cognitive routes with respect to consumers' adoption decision showing, in their first study, that consumers simplify their decision by using one or more dominant reasons and that "reasons against" adoption have a stronger impact than "reasons for" adoption. On the other hand, the second study confirms

the cognitive routes of values, reasons and attitudes with a lower influence of the adaption factors. The two different studies showed that the BRT offers managers a tool that helps them to effectively identify and differentiate between pro- and anti-adoption factors, and to understand the relative importance of these factors with respect to consumers' adoption decision. In a recent study, Diddi et al. (2019) found that consumers use "reasons for" and "reasons against" adoption, in addition to the belief concepts used in the TRA and TPB, to justify their decision. The authors found that even though consumers are knowledgeable and engaged with respect to sustainable activities, they do not engage in the same way when making a decision about clothing. "Reasons for" this, including the perception that sustainable clothing consumption behaviour is expensive and that the benefits for the consumer are not clear enough, are influencing their decision. In the context of sustainable clothing consumption behaviour, the authors recommend that companies focus on consumers whose value priorities fit the product. They also suggest that companies include convenience, affordability and a clear view on value creation in their communications. The BRT provides valuable insights based on the "reasons for" and "reasons against" adoption, which can help companies define a more detailed approach to enhance sustainable clothing consumption.

Ryan and Casidy (2018) used the BRT to research organic food purchases. In line with prior research (Claudy et al., 2013; Claudy et al., 2015), they found that values have a significant effect on consumer reasoning and attitude. In contrast to prior studies, in addition to examining the effect of values on attitude and intention, they looked at ways in which the relationship between these two constructs is mediated by consumer reasoning depending on varying levels of brand reputation. They extended the BRT by implementing reasoning as an external attribute, which influences the relationship of values and attitude. The results show that values can bolster "reasons for" organic food consumption and minimize "reasons against" it. Including brand reputation into the framework shows that with low brand reputation, values alone are sufficient to drive attitudes towards organic food purchase; whereas high brand reputation, needs to be reinforced through reasoning to drive attitude and intention. "Reasons for", in particular, fully mediate decision making when brand reputation is high; therefore, values alone are not sufficient to drive consumer attitude and should be reinforced through reasoning. When the brand reputation is low, the direct effects of values on attitude remain significant suggesting that reasoning, on its own, plays a partial mediation role and values alone are sufficient to drive positive consumer attitude towards organic food.

In the pro-environmental context, the BRT has been shown to improve the predictability of behavioural intention and the development of additional input for the optimization of communication around pro-environmental measures, based on the clear differentiation of "reasons for" and "reasons against" pro-environmental decisions. A better understanding of how consumers integrate CO_2 emission reduction considerations into their purchase behaviour of dairy products can help to develop recommendations for the industry to communicate pro-environmental behaviour more effectively and increase the consumer contribution to the CO_2 emission reduction.

Following the discussion around the TRA, TPB, NAM and BRT in the pro-environmental context, it is assumed that utilizing a framework based on the BRT and NAM can contribute to the literature and can help to improve the contribution of consumers to the CO_2 emission reduction goals of dairy companies. Only if consumers understand the importance of CO_2 emission reduction in the dairy industry and dairy companies clearly communicate their pro-environmental approach, can a positive effect on CO_2 emissions, supported by consumers of dairy products, be achieved.

The recommended approach adds to existing research on environmentally responsible purchase behaviour as summarised by Yu et al. (2020). Yu et al. (2020) categorized the results of existing research into three groups: (1) defining green consumers by individual demographic characteristics;(2) defining the psychological mechanism of green purchase behaviour by extending classic theories like the TPB;(3) defining the decision-making process of consumers' green consumption behaviour using rationalism (i.e. collection of as much information as possible), behaviouralism (i.e. use of own strategic skills and knowledge to estimate the effort required for the decision), and empiricism (i.e. decisions based on emotional preferences for green products). Yu et al. (2020) conclude that existing research explains green consumption behaviour, but neglects the wider perspective of environmentally responsible behaviour. Environmentally responsible behaviour is driven by consumer knowledge about the environment and the challenges it faces, attitudes towards the product in the environmental context, and the standard of environmental products (Cherrier, 2009; Barr et al., 2005; Steg et al., 2005; Zsóka et al., 2013). Another factor influencing pro-environmental behaviour is environmental concerns, which are often regarded as a predictive variable which motivates environmental purchase intention (White and Simpson, 2013; McDonald et al., 2015; Pagiaslis and Krotalis, 2014; Bamberg, 2003). Environmental concerns can be defined as concerns for a

specific environmental issues, such as CO_2 emission reduction or more comprehensive and universal environmental issues.

For the purposes of this research on the purchase of dairy products produced with CO_2 emission reduction in mind, the researcher argues that in addition to the responsibility of companies and policy makers to assure environmentally friendly production and regulations, it is also the responsibility of consumers, as stakeholders, to support the CSR activities of manufacturing companies by making environmentally friendly choices when purchasing dairy products. This argumentation adds to the view of Yu et. al (2020), who state that manufacturer compliance with increasing rigorous environmental standards related to making their products more environmentally friendly is the most reasonable approach to improve environmentally responsible behaviour. Company compliance would make consumers feel that purchasing green products is a required socially responsible action, and would make them appreciate the environmental benefits. To illustrate this, Yu et. al (2020) use the example of reusable bags. A suitable environment for environmentally responsible consumer purchase behaviour exists in the context of European countries, such as Germany, where knowledge about environmental challenges is high and environmental concerns for CO_2 emission reduction form part of political discussion on a daily basis. Attitudes towards the products in the environmental context and the standards in the market are already established; therefore, an increase in consumer contribution is expected, provided that manufacturers are able to communicate effectively on the topic of responsible production, packaging and distribution of their goods in a targeted and convincing manner.

The following research approach aims to facilitate a deeper understanding of consumer intention to purchase dairy products produced with CO_2 emission reduction in mind in order to support manufactures in their CSR approach, especially with respect to reaching their CO_2 emission reduction goals.

Chapter 4: Theoretical Framework and Hypotheses

4.1   Introduction

Environmentally responsible behaviour is driven by consumer knowledge about environmental challenges, consumer attitudes towards the product in the environmental context, pro-environmental industry standards, and environmental consumer concerns (Yu et al., 2020). In order to integrate the different drivers for the pro-environmental behaviour of consumers, this researcher has combined the Behavioural Reasoning Theory (BRT) and the Norm Activation Model (NAM). The goal is to cover pro-environmental behaviour predominately believed to be driven by self-interest (*e.g.* minimising health risk) through use of the BRT, and pro-environmental behaviour driven by pro-social motives (*e.g.* concern for other people, future generations, other species, and/or the whole eco-system) through use of the NAM (Bamberg et al., 2007; Bamberg and Moser, 2007).

Applying these two different approaches enables the development of a more holistic picture regarding consumer concerns and actions in the context of CO_2 emission reduction in the production and delivery process of daily-consumed products, such as dairy products. This information and subsequent recommendations based on the data are intended to support the dairy industry in enhancing pro-environmental consumer purchasing intention and behaviour. For industry and manufacturers to be able to develop an effective communication strategy and thereby enhance consumer contribution to the reduction of CO_2 emissions, they need to have a clear understanding of pro-environmental consumer behaviour in the context of purchasing dairy products produced under the consideration of CO_2 emission reduction.

The following section provides detailed information on the two models applied by this research and serves as the foundation upon which the hypothesis has been developed.

4.2   Behavioural Reasoning Theory

The Behavioural Reasoning Theory (Westaby, 2005) builds on Ajzen's Theory of Planned Behaviour (TPB) (Ajzen, 1991) by adding context specific "reasons for" and "reasons against" certain behaviours as a link between people's beliefs and global motives, intention and behaviour. Firstly, the TPB will be introduced, followed by its extension with "reasons for" and "reasons against" certain behaviours.

The TPB builds on the assumption that purchase intention directly leads to purchase behaviour (Ajzen, 1991; Chatzidakis et al., 2007; DePelsmacker and Janssens, 2007; Vermeir and Verbeke, 2008) and attitude is considered as one of the major factors that guides human behaviour (Bredahl, 2001).

In multi-attribute models like the TPB (Ajzen, 1991), attitudes are considered to affect intention to perform a given behaviour, and intention impact behaviour (Petty et al., 1991). Therefore, ethical consumer behaviour models based on TPB are built on the idea of following core cognitive progression:

(1) beliefs determine attitudes;

(2) attitudes lead to intentions; *and*

(3) intentions inform behaviour.
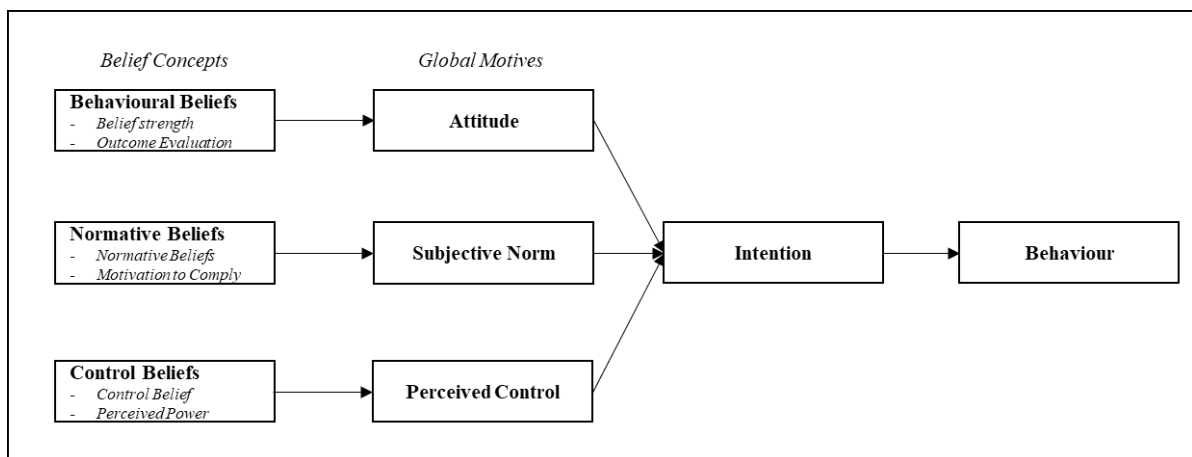
Figure 4.1 The Theory of Planned Behaviour (Ajzen, 1991).

Within the TPB (*see* Figure 4.1), attitude towards a given behaviour, subjective norms, and perceived behavioural control are classified as global motives, which are described as the primary antecedents of intention (Ajzen and Madden, 1986) and mediators of the effect of the belief concepts (Ajzen, 1991).

The global motives are informed by the belief concepts. Attitude towards a given behaviour is determined by behavioural beliefs and refers to the "degree to which a person has a favorable

or unfavorable evaluation of the behavior in question" (Ajzen, 1991, p. 188). In marketing, attitudes are seen as key determinants of consumer purchase decisions and positive attitudes towards a product, service, and/or innovation are likely to have an impact on purchase intention (Bagozzi, 1992). This has been confirmed in several studies in the environmental context where attitude has often shown the highest contribution in predicting consumer purchase intention (i.e. Ryan and Casidy, 2018; Shin et al., 2018; Yadav and Pathak, 2016). Attitude is built on a judgement about the behaviour under consideration and a decision about whether the individual wants to conduct the behaviour (Leonard et al., 2004). Several studies suggest that people with a more positive attitude towards a particular behaviour are more likely to engage in such behaviour (i.e. Bagozzi, 1992).

Normative beliefs represent how an individual feels about the behaviour that is expected of them by relevant others. Control beliefs refer to the perception around how easy or difficult it is to perform the planned behaviour. This behaviour is based on past experience, anticipated hindrances, and obstacles; it builds on the basis of the perception of behavioural control (Ajzen, 1991). Moderating intentions and behaviour is based on the belief concepts, attitude, subjective norms, and perceived behavioural control (DePelsmacker and Janssens, 2007). Therefore, attitudes, subjective norms and perceived behavioural control are considered to be functions of beliefs, linking to a person's intention to perform a defined behaviour (Ajzen and Fishbein, 1980).

As discussed in the previous chapter, the TPB has been successfully applied in the context of pro-environmental decision making. In these studies, consumers' general beliefs about certain products have been evaluated. However, context specific reasons which can help to gain deeper insight into the cognitive routes associated with consumer purchase intention development are missing. In research centered around consumer adoption of a new product, technology, or a new behaviour (Claudy et al., 2015 (innovation adoption); Gupta et al., 2017 (mobile banking); Arli and Lasmono, 2015; Chatzidakis et al., 2016 (charitable giving)), context specific reasons have been shown to improve intention prediction. Looking at the research question for this study – predicting the purchase intention for dairy products produced under the consideration of CO_2 emission reduction – consumers may need to change their purchase decision process for a low involvement product, such as a dairy product, when the topic of CO_2 topic is added to the equation. In these situations, context specific reasons are expected to provide valuable insights.

The Behavioural Reasoning Theory (Westaby, 2005) adds context specific reasons to the TPB. Prior BRT studies suggest that BRT-based models better explain the variance of the dependent variable than other behavioural theories (Claudy et al., 2015).

The BRT, in line with the TPB, uses the linkage between beliefs or values, global motives – attitudes, subjective norms, and perceived behavioural control, and behavioural intentions, and adds the "reasons for" and "reasons against" a given behaviour. which are believed to mainly affect the consumer's attitude. The overarching theoretical proposition of the BRT is that reasons serve as an important link between people's beliefs, global motives, intentions, and behaviour (Westaby, 2005; Ryan and Casidy, 2018). There are different advantages of the BRT for this research. Firstly, the two added measures – "reasons for" and "reasons against" a certain behaviour – are expected to provide a better explanation of the human decision-making process. These reasons describe two critical, but different, perspectives that influence user intentions and actual behaviour, which may offer valuable insights. Secondly, "reasons for" and "reasons against" a given behaviour are context specific, provide rich contextual information and help the individual to feel more confident with their decision. Thirdly, the additional cognitive routes, in the form of reasons, offer the possibility to develop a better understanding of human behaviour and decision making. Fourthly, values and beliefs play a role in predicting reasons, intention, and consumer behaviour. These four main advantages will be discussed in more detail in the following section.

1. **Including reasons to explain the human decision-making process**

The inclusion of "reasons for" or "reasons against" a certain behaviour extends the TPB by contextualizing reasons related to the specific behaviour under investigation (Westaby, 2005). Reasons are generally defined as "the specific subjective factors people use to explain their anticipated behaviour" (Westaby, 2005) and are assumed to serve as fundamental antecedents of global motives and intentions (Westaby, 2005). The "reasons for" and "reasons against" are qualitatively distinct constructs, which influence consumer decisions differently (Claudy et al., 2015).

2. **Context specific – contextual information**

In contrast to beliefs, reasons are context specific and can be defined as specific factors people use to explain their anticipated behaviour; a specific cognition connected to a behavioural explanation. Individuals look for different behavioural options, which have the most justifiable

and defensible set of reasons in favour of implementing their decisions with confidence and protecting their individual self-worth. Even if the individual's global motives – attitude, social norms and behavioural control – are not perfectly aligned with the decision, their increased confidence in the decision supports reasons and works as a powerful driver of intention (Westaby, 2005). The effect of reasons can also be direct, go beyond that which can be explained by global motives (Tudor et al., 2007; Westaby et al., 2010). Reasons can further serve as barriers (i.e. "reasons against") which can help to explain consumer behaviour, which allows researchers to test the different thought mechanisms through which consumers form their attitudes and intention (Westaby, 2005). In general, research has shown that individuals respond differently to reason scales than to traditional belief concepts (Westaby, 2002; Westaby and Braithwaite, 2003; Westaby, 2005).

3. Providing additional contextual routes

In the BRT, reasons represent the subjective probability that a specific factor is part of an individual's behavioural explanation, whereas beliefs represent the probability that an individual's behaviour could result in a wide array of outcomes (Westaby, 2005). Reasons are a specific cognition, linked to people's explanation of their behaviour, and allow researchers to test different cognitive routes via "reasons for" and ""reasons against"". They have been used in various contexts, such as innovation adoption (Claudy et al., 2015), charitable giving (Arli and Lasmono, 2015; Chatzidakis et al., 2016), urban bicycle commuting (Claudy and Peterson, 2014), and adoption of mobile banking (Gupta et al., 2017). Furthermore, reasons in contrast to beliefs, put individuals in a future-looking mindset by including attribution for the future state, based on the present condition (Fishbein and Ajzen 1975). The reason justification mechanism is not always activated, and belief stimuli can automatically generate global motive perception (Westaby, 2005).

4. The importance of values/beliefs in predicting reasons, intentions, and user behaviour

Values and beliefs are important components of the BRT. Values are linked to the cognitive patterns associated with subjective judgement and decision making (Fishbein and Ajzen, 1975). Theories, such as the expectancy value theory (Fishbein and Ajzen, 1975) and the reasons theory (Westaby, 2005), suggest that beliefs or values are strong predictors of reasons (Ryan and Casidy, 2018); they are different from reasons in the context of describing people's

behaviour as reasons represent a more narrow chain of thoughts than values or beliefs (Westaby, 2005).

Following the discussion above, it becomes obvious that combining behavioural intention models and reason concepts can support the understanding of pro-environmental consumer purchase decisions, where the activation of the justification and defence mechanisms presented can play an important role (Westaby, 2005). Furthermore, it is expected, that reasons, especially "reasons against", can provide further insights into anticipated behaviour. Examples of reasons could include health aspects, low personal involvement when purchasing dairy products, general change in diet from animal-based to plant-based dairy products, and general reluctance to change purchase intention for low involvement products.

This research sets out to test the effect of reasons in the context of pro-environmental consumer purchase decisions for a low involvement products.
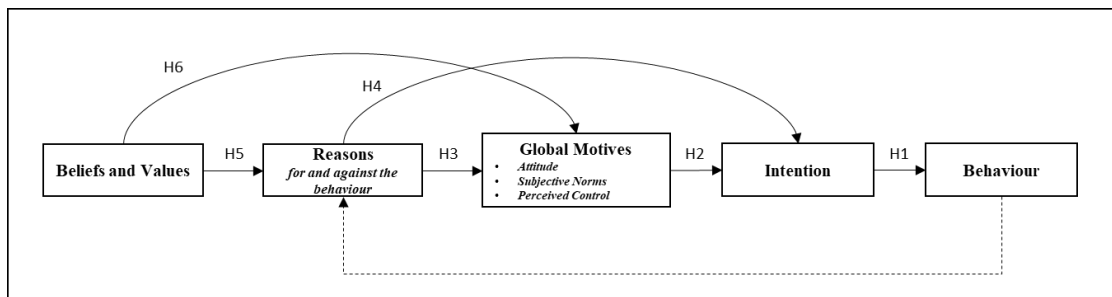
Figure 4.2 Model of Behavioural Reasoning Theory (Westaby, 2005)
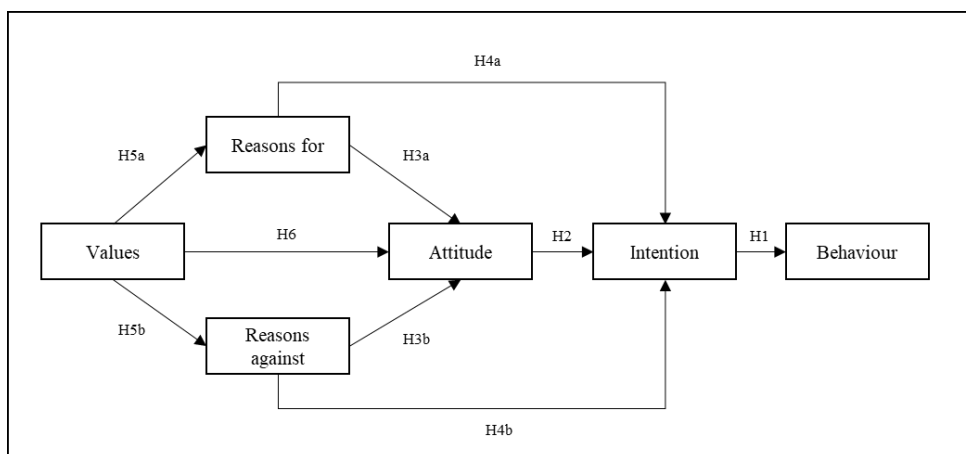
Figure 4.3 Model of Behavioural Reasoning Theory adapted from Claudy et al. (2015)

The BRT model developed by Westaby (2005) is shown in Figure 4.2. The original model is based on the TRA/TPB and includes global motives – attitude, subjective norms and behavioural control. Most of the studies conducted over recent years focus on attitude (*see* Figure 4.3) as the most important determinant of consumer purchase decisions, considering the marketing perspective (Claudy et al., 2015). In the literature, attitude is explained as a "psychological tendency that is expressed by evaluating a particular entity (e.g. innovation) with some degree of favo[u]r or disfavo[u]r" (Eagly and Chaiken, 1998, p.1). Individuals who have a positive attitude are more likely to adopt a particular behavioural intention and behaviour, meaning that the behavioural intention can be predicted. In marketing, attitudes are seen as key determinants of consumer purchase decisions, and research suggests that people who hold more positive attitudes towards innovation are more likely to adopt it (Bagozzi 1992).

As discussed in the chapter above, studies in the pro-environmental context show that the BRT can explain a relatively higher variance in behavioural intention and behaviour than the TRA and TPB (i.e. Diddi et al., 2019; Ryan and Casidy, 2018; Claudy et al., 2015; Claudy et al., 2013). Most of the research focuses on high involvement decisions, such as sustainable transportation and renewable energy consumption. The study conducted by Ryan and Casidy (2018) used the predictive power of the BRT in the context of low involvement organic food purchases and supported the importance of including "reasons for" and "reasons against" in the pro-environmental context.

The distinction between high and low involvement products is important because the level of product involvement describes the perceived relevance and interest in a product (Traylor, 1981; Hansen, 1985; Richins and Bloch, 1986). High involvement products are typically durable products, such as cars, electronics, appliances. Consumers often spend a significant amount of time searching for information before coming to a decision (Clarke and Belk, 1978; Kerin et al. 2006; Kuruzovich et al. 2008; Moorthy et al. 1997; Murray 1991; Viswanathan et al. 2007). In the context of high involvement, the purchase decision comprises a financial risk and consumers generally deal with the product for a longer period of time (Laurent and Kapferer, 1985; Hoyer and McInnis, 2008). Consumable products, such as groceries, are typical examples of low involvement products. The consequences for making a wrong decision in the context of low involvement products are limited and consumers are less likely to spend a considerable amount of time on product research (*e.g.,* Dholakia, 2001; Levy and Nebenzahl, 2008; Mathwick and Rigdon, 2004).

Dairy products are considered to be low involvement products. The question is whether introducing CSR topics into the decision process of a low involvement product can facilitate behavioural intention prediction. It can be assumed that, for example, promoting CO_2 emission reduction in the production process of a dairy product may change the consumer decision process; more specifically, it may increase the time spent on searching for relevant information before the decision is taken.

For the purposes of this research, centred around the purchase intention for dairy products produced under the consideration of CO_2 emission reduction, it is assumed that the BRT, considered as a self-interest theory based on rational choice, does not fully accommodate pro-social and altruistic motives when predicting purchase intention. The TPB and BRT have often been criticized for insufficiently capturing normative and moral influences on behaviour (Armitage and Conner, 2001; Sparks and Sheperd, 2002) by assuming that these influences are mediated by subjective norms and attitude (Ajzen and Fishbein, 1980; Manstead, 2000). Ajzen and Fishbein (1980) acknowledge that integrating moral norms or perceived moral obligations into the TRA may strengthen the approach; however, they keep parsimony of the model and focus on careful measurement of the existing components. Other research suggests the inclusion of measures reflecting moral and ethical concerns for certain kinds of behaviour (Beck and Ajzen, 1991; Gorsuch and Ortberg, 1983; Schwartz and Tessler, 1972; Zuckerman and Reis, 1978), as a useful addition to the TPB, either as a part of attitude (Thøgersen, 2007) or as separate construct (Arvola et al., 2008). Recent studies have successfully started to integrate different theoretical approaches (Shin et al., 2018; Park and Ha, 2014; Han, 2015).

For the purposes of this research, it is argued that a combined self-interest and pro-social approach will help to improve the prediction of purchase intention. The main reason for integrating an altruistic model into the research approach is that in context of this study, it is important to include the indicators leading to moral obligation in order to gain a better understanding of motivators and the current status of considering CO_2 emission reduction in the purchase decision for the low involvement dairy products. A model often used in the context of predicting purchase intention based on moral obligation is the Norm Activation Model, developed by Schwartz (1977, 1984). The NAM includes personal norms (PN) as a construct. Personal norms are clearly differentiated from subjective norms (SN) in the BRT. Personal norms are internalised as moral rules or values, whereas subjective norms reflect external social pressure on the individual. This research defines personal norms as norms through which the

consumer makes a decision on whether to consider the CO_2 emission reduction in their purchase process based on their own personal moral principles and personal responsibility emissions reduction. Moral obligation is assumed to be one of the main constructs influencing the purchase decision.

Furthermore, the researcher aims to develop insights into the development and activation of personal norms by considering awareness of consequences (AC) and ascription of responsibility (AR). The question is whether consumers in Germany are, due to the intense and ongoing discussion around CO_2 emission reduction – i.e. "Carbon neutral by 2050", "Energiewende", "Erneuerbare Energiequellen" - and the developed UN Sustainability Goals (mainly goals 12 and 13), aware of dairy industry CO_2 emissions and of activities the industry has implemented to reduce their CO_2 emissions. *Do consumers consider this in their purchase decisions? How can dairy companies improve consumer contribution to their CSR agenda?* Answering these questions can be supported by the constructs of awareness of consequences and ascription of responsibility in the NAM.

Based on the discussion above, this research will combine the BRT and the NAM to further develop knowledge of rational and altruistic decision making in the context of low involvement products. In the following section, the NAM will be examined in more detail.

4.3   Norm Activation Model

The Norm Activation Model, developed by Schwartz (1970, 1975), is considered to be a pro-social theory and has been used to predict people's altruistic and pro-social behaviours (DeGroot and Steg, 2009). Pro-social behaviour is described as an action that intends to help other people through a broad range of helping, sharing, and cooperating behaviours (De Groot and Steg, 2009; Zhang et al., 2013) and is closely linked to a person's morality. The model defines altruistic or pro-social behaviour towards a person or a more abstract entity (e.g. the environment) in need. Pro-environmental behaviour can be considered as pro-social behaviour because it involves positive consequences for others (Steg and De Groot, 2010) and includes any type of behaviour that mitigates a harmful impact of a particular action on the environment (Kollmuss and Agyemanm, 2002).

In his model, Schwartz describes the relationship between activators, personal norms, and behaviour (Schwartz, 1970; 1975; 1977; Schwartz & Howard, 1984). According to this theory, norm activation refers to a process in which people construct self-expectations regarding pro-social behaviour that are linked to the social environment of the individual (Kerr et al., 1977).

Personal norms are defined as a person's feeling of "moral obligation to perform or refrain from specific actions" (Schwartz and Horward, 1981, p.191) and are tied to the self-concept. The concept of personal norms refers to internalised norms and values of significant others, i.e. each person's own views about right and wrong, which have been learned throughout life (Schwartz, 1977). If an individual can live up to these expectations, i.e. their personal norms, this may lead to enhanced self-esteem, pride, security, or positive self-evaluation; acting against them can result in feelings of guilt and self-depreciation, loss of self-esteem, or negative self-evaluation (Schwartz, 1977).

The model considers two personality trait activators, the awareness of consequences and ascription of responsibility, which indicate that individuals are differentially inclined to adopt pro-social behaviour. Awareness of consequences refers to a person's awareness of negative consequences for others or abstract entities when not acting pro-socially (De Groot and Steg, 2002). If individuals consider the negative impact of their actions on others/abstract entities, they are more likely to have feelings of obligation resulting from personal norms (Schwartz, 1977). Awareness of negative consequences for others associated with a behaviour triggers the feeling of responsibility, which then activates personal norms determining whether to perform another behaviour to mitigate the negative consequences (Gao et al., 2016; Han, 2014). Ascription of responsibility describes the feeling of responsibility for negative consequences of not acting pro-socially (De Groot and Steg, 2009).

The relationship between the key factors of the NAM – AC, AR, and PN - is discussed in the literature. There are mainly two different research streams. One describes the NAM as a mediator model and focuses on the sequential influence of awareness of consequences, ascription of responsibility, and personal norms on the intention (Steg and De Groot, 2009). The other defines AC and AR as moderating the relationship between PN and behavioural intention. This means that individuals with a higher level of AC and AR have a stronger influence on the relationship between PN and behavioural intention (Gao et al., 2016). Figure 4.4 shows NAM as a moderator and mediator model.
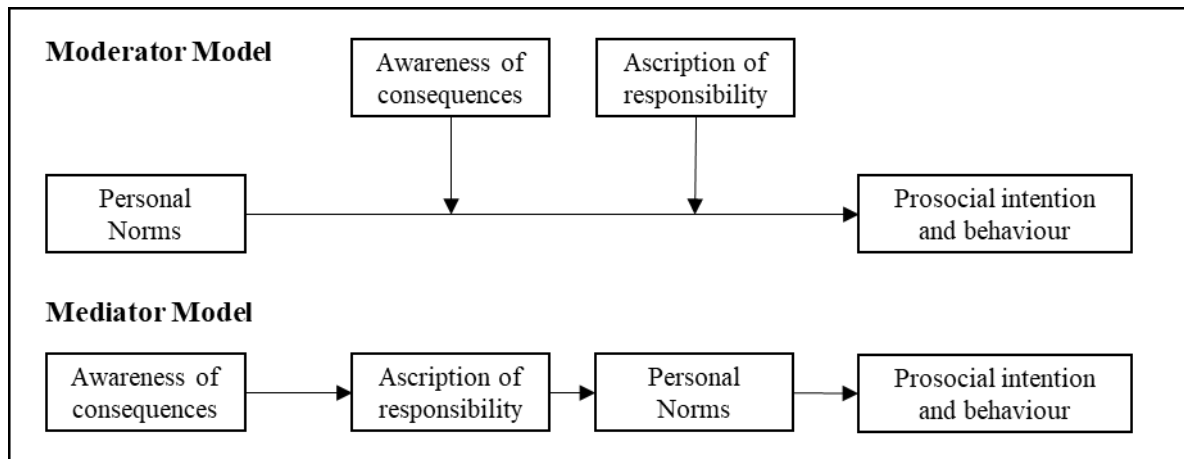
Figure 4.4 Norm Activation Model of pro-social behaviour as a moderator and mediator model (Steg and de Groot, 2009)

This research will follow the findings of Steg and de Groot (2009) who support the NAM as a mediator model in accordance with Schwartz and Horward's (1981) original proposition and as supported by several study results (i.e. Bamberg et al., 2007; Gräling et al., 2013; van der Werff and Steg, 2015; Han et al., 2015; Zhang et al. 2018; Wang et al., 2019; Onwezen et al., 2013). This means that an individual has to be aware of the consequences of the social or pro-environmental problem before AR has an effect on the feeling of moral obligation to act pro-socially and affects the behavioural intention. In some of their studies, Steg and de Groot (2009) also observed a direct effect of AC and AR on PN, which supports a partially mediated relationship. However, based on their results they expect that policies have the strongest effect when their original aim is to raise awareness of the problem under consideration, before focusing on AR and PN.

In considering NAM as mediator model, this research suggests that individuals have to be aware of the consequences of their pro-social behaviour, and feel responsibility for any negative consequences, which can lead to increased feelings of moral obligation and behavioural intention.

As discussed in the previous chapter, the NAM has been successfully applied in different pro-environmental contexts, mainly to do with high involvement products. Only limited research has been found to deal with low involvement products, which is where this research aims to make a contribution.

4.4   Combined theoretical approaches

An increasing number of studies are combining different theoretical models to increase the predictive power of behavioural intention in the context of pro-environmental decision making. Recent studies have integrated the TPB and the NAM (Shin et al., 2018; Park and Ha, 2014; Han 2015) and have shown that the explained variance in behaviour could be increased by the integration of the two models in the pro-environmental context. Park and Ha (2014) combined the TPB and NAM in illustrating the significant impact of personal norms, as well as attitude and behavioural control, on recycling intention. Han et al.'s (2014) research on an individual's decision making around attending an eco-friendly convention confirmed that the incorporation of attitude and personal norms in one model added to the prediction of behavioural intention. In further research on pro-environmental lodging, Han et al. (2015) included attitude and subjective norms to the NAM, which showed an improvement in the predictive power of behavioural intention. Shin et al. (2018) integrated the TPB and NAM, improving the understanding of consumer intention to choose organic menu items and to visit restaurants featuring organic menu items. Interestingly, the researcher did not find a publication combining the NAM and the BRT even though studies have shown that, in the environmental context, the BRT combined with consideration of context specific "reasons for" and "reasons against" a given behaviour can explain a higher variance in behavioural intention than the TRA and TPB.

This research sets out to strengthen the predictability of behavioural intention to buy dairy products where CO_2 emission reduction has been considered as part of the production process. A better understanding of consumer decision making for low involvement products when purchasing daily groceries, such as dairy products, is considered to be valuable. The dairy industry has a large impact on CO_2 emissions, dairy companies invest a lot into reducing their CO_2 emissions and have ambitious goals in this respect. Dairy companies have outlined clear targets to achieve their goals across workstreams, with a focus on farming, logistics, operations, and packaging. Even though farming is responsible for a big part of GHG emissions, not only limited to CO_2 emissions, CO_2 emission reduction in the other workstreams also plays an important role.

It is not clear yet how the industry can effectively increase consumer contribution to company climate targets by choosing products from manufacturers with a high pro-environmental involvement. Clear communication could support the industry in two ways: (1) companies with

a high pro-environmental involvement would see an increased consumer interest and readiness to buy their dairy products; and (2) increased consumer awareness and interest will motivate more manufacturers to invest more in pro-environmental activities. Consequently, consumer contribution to CO_2 emission reduction targets for the industry can be increased.

To gain a deeper understanding of the consumers purchase intention for dairy products produced by companies which are committed to CO_2 emission reduction, this research uses two theoretical models - the BRT and the NAM. Both theoretical models show good predictability of behavioural intention in the pro-environmental context. By using constructs from both models, this research expects further improvement of the predictability of the behavioural intention.

In the following section, the proposed research model and hypothesis will be introduced.

4.5   Proposed research model and hypotheses

To summarize the discussion on the different research models and approaches in the section above, table 4.1 and 4.2 show the main references used for the development of the model for this research.

Research Model Development		
Main Theories	**Author**	
Behavioural Reasoning Theory (BRT)	Westaby (2005)	Part of the Research Model
Norm Activation Model (NAM)	Schwartz (1970, 1977)	Part of the Research Model
Theory of Planned Behaviour (TPB)	Ajzen (1991)	Theory informing the BRT

Table 4.1 Research model development – main theories

Research Model Development - Literature			
Theory	Author	Topic	
TPB	Arvola (2007)	Predicting intentions to purchase organic food - consideration of affective and moral attitudes	Indicating that moral norms have an influence and are partially mediated through attitudes and partially direct - regional differences (Finland, UK, Itlay)
TPB	Vermeir and Verbeke (2008)	Sustainable food consumption - dairy products	Support of the application of TPB when dealing with sustainable food consumption - dairy products; general definition of "sustainable"; focus on highly educated young adults
BRT	Claudy et al. (2013, 2015)	Consumers resistance to innovation - product and service	Support of BRT as a framework for innovation adoption
BRT	Casidy and Ryan (2018)	Brand reputation in organic food consumption; mediating role of consumer reasoning between values and attitudes, evaluation of drivers and barriers of organic food	Support of the BRT looking at values, attitudes and intention in the context of organic foiod purchase
BRT	Diddi et al. (2019)	Exploring young adult consumers' sustainable clothing consumption intention-behavior gap	Confirmed the effect of resaons for and reasons against on consumers purchase intention of sustainable clothing
BRT	Tandon et al. (2020)	Behavioural reasoning perspectives on organic food in India	Suggesting that attitude and reasons for resulted in favourable purchase intentions, attitude partially mediates the association of reasons and purchase intentions for organic food
NAM	Gärling et al. (2003)	NAM in the context of proenvironmental behaviour - the intention to perform collective pro-environmental	Support the application of the NAM - effect of AC, AR, PN on the purchase intention
NAM	De Groot and Steg (2007, 2009)	NAM in the context of pro-social behaviour - 5 studies to test the mediation and moderator model	Support for the mediation model
NAM	Zhang et al. (2018)	Understandnig of the three different interpretation of the NAM to predict public-sphere pro-environmental	Support the application of the NAM as a mediation model in the pro-environmental context
NAM	Wang et al. (2019)	NAM in the context of pro-environmental behaviour	Support the application of the NAM - effect of AC on AR, AC/AR on PN, PN on intention
TPB and NAM	Bamberg et al. (2007)	Role of personal norms in consumers' decision to choose public transport	NAM/TPB - support the effect of PN, AT and BC
TPB and NAM	Park and Han (2014)	Understanding consumer recycling behaviour	NAM/TPB - supported effect of AT, BC, PN, AC, AR; SN does not have a direct effect on intention, when PN is added
TPB and NAM	Onwezen et al. (2013)	Role of anticipated emitions - pride and guilt in the NAM and in the combined model	Supporting the integrating the NAM and the TPB: effects of personal norms and anticipated emotions on behaviour are mediated by behavioural intentions
TPB and NAM	Shin et al. (2018)	Consumer behaviour regarding organic menues, organic restaurant visit	NAM/TPB - supported, attitude as the main driver; organic defined as pro-environmental; health (self-interet) not considered

Table 4.2 Research model development - literature

Following the discussion on the combination of the BRT and the NAM, this section focuses on the research model and the development of the different hypotheses.

The theoretical research model combines the BRT and the NAM to predict consumer purchase intention (*see* Figure 4.5). Both models have been discussed in detail in the Section 4.3.
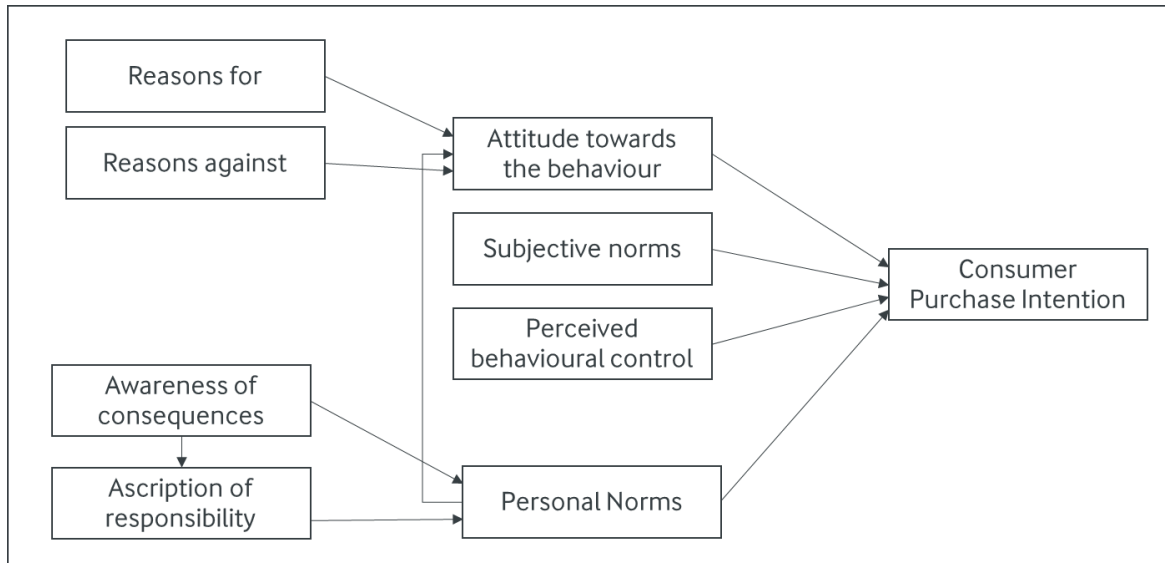
Figure 4.5 Theoretical Model for this research integration of BRT (Westaby, 2005) and NAM (Schwartz, 1977)

To answer the research question, the following chosen approach sets out to develop a more comprehensive understanding of consumer intention to buy dairy products where CO_2 emission reduction considerations are integrated into the production and delivery process:

- the moral perspective represented by PN and the activators of PN – AC and AR;
- the connection between PN and AT; *and*
- the context specific "reasons for" and "reasons against" the behaviour.

With the integration of the moral perspective in the context of low involvement purchase decisions, the researcher aims to indicate the importance of altruistic and pro-social motivations, which will require companies to adopt a different approach to communications and sales when focusing on CO_2 emission reduction.

In order to gain insight into personal norms and their relevance in the purchase decision process, it is important to understand the personality trait activators for PN, which reflect the differences in readiness of consumers to apply pro-social behaviour. If the consumer considers the negative effect of the action, their sense of responsibility can be triggered, which in turn can activate their personal norms as described by the NAM (Schwartz, 1977).

The effect of PN on AT will be examined to gather information about the connection between moral norms and attitude. With this link, the researcher aims to evaluate whether moral norms, as part of attitude, can provide sufficient information or whether it is important to examine

moral norms separately in the context of pro-environmental low involvement purchase decisions.

Furthermore, for the purposes of this research, it is assumed that context specific drivers manifested as "reasons for" and "reasons against" the given behaviour can improve the prediction of the consumer purchase intention and help to develop a more complete understanding of consumer's decision making (Westaby, 2005). A deeper understanding of the consumer purchase decision making process can help to define an effective communication strategy for companies. For example, even though consumers show a positive attitude towards pro-environmental behaviour, there is a chance that context specific reasons can be a decisive barrier for buying pro-environmental products.

In the context of this study, this could mean that an individual who always buys products produced in an environmentally friendly way due to their attitude, decides not to consider the CO_2 emission impact associated with the production of a given dairy product because they place more importance and base their decision on different aspects, such as health.

In accordance with several studies, the researcher focuses on the effect of "reasons for" and "reasons against" a particular behaviour on attitudes and does not consider the effect of reasons on all three global motives – attitude, subjective norms and behavioural control. The majority of previous studies focus on the connection between "reasons for"/"reasons against" and attitude and confirm the effect of the reason concepts on attitude (Ryan and Casidy, 2018; Tandon et al., 2020). The contextual setting for the chosen focus is that consumers with strong reasons to engage in pro-environmental behaviour are expected to have more positive attitudes towards the behaviour. Especially in the context of low involvement pro-environmental decision making, no support for the effect of reasons on other global motives, subjective norms and behavioural control could be found. In the context of high involvement purchase intention, only the study conducted by Peterson and Simkins (2018) showed a positive effect of "reasons for" on subjective norms whereas "reasons against" only show a significant effect on attitude. In this study the overall effect of "reasons for"/"reasons against" on attitude and subjective norms is similar. The researcher argues that in the context of the high involvement decision making regarding car sharing, the decision process takes more time, and consideration of people who are close with the decision maker may play an more important role and their opinion may support the decision making process.

Due to the fact that this research is about a low involvement purchase decisions, the researcher follows the main body of literature and focuses their research model on the effect of "reasons for"/"reasons against" on attitude only. By only considering one global motive – attitude - the researcher also avoids further complexity of the model.

Including moral norms in the model through implementation of the NAM is considered important by the researcher in the context of pro-environmental behaviour. The impact of moral obligations on different pro-social behaviours has been confirmed in many different studies as mentioned above. The researcher chooses the mediation model as awareness of consequences has a direct effect on personal norms and will be partially mediated by ascription of responsibility. Before personal norms can be activated, the individual has to be aware of the consequences and should be ready to take responsibility for theme. In the context of this study, this means that the individual has to be aware that their food consumption, of dairy products especially, has a significant impact on CO_2 emissions; they have to ascribe responsibility on themselves for their CO_2 emission contribution when buying dairy products. It is important to consider: (1) whether consumers know that CO_2 emissions resulting from the food production process, especially in the dairy industry, have a huge impact on the environment; (2) whether consumers themselves feel responsible for the negative consequences of these CO_2 emissions; and (3) whether and how the topic of CO_2 emissions impacts consumer purchase decisions. If consumers are aware of the consequences and feel responsible for them, it is assumed that they will demonstrate pro-social behaviour by generating positive consequences for the environment, the abstract entity.

As discussed in the previous chapter, different studies have successfully applied the NAM in the pro-environmental context (i.e. Bamberg et al., 2007; Gräling et al., 2013; van der Werff and Steg, 2015; Han et al., 2015; Zhang et al. 2018; Wang et al., 2019). The integration of the altruistic perspective into the NAM has shown an impact on consumers and is, therefore, integrated into this research model.

In the next section, the researcher will develop the hypotheses for this study. The hypothesis is implicit in the developed research model in Figure 4.6 and will be discussed in two different sections, starting with the hypothesis for the BRT followed by the hypothesis based on the NAM. An additional hypothesis, combining the two models and the moderator effect, will be explained at the end.

4.5.1 Hypotheses related to the Behavioural Reasoning Theory

In this section, the hypotheses for the BRT in the context of consumer consideration of CO_2 emission reduction when buying dairy products will be discussed.

Attitude (AT)

In the environmental context, Bamberg (2003) defines attitude as a "cognitive and affective evaluation of the object of environmental protection" (p.21). Prior research confirmed that attitude is one of the strongest predictors influencing pro-environmental behaviour (e.g. Shin et al., 2018; Verma and Chandra, 2018; Yadav and Pathak, 2016; Peterson and Simkins, 2019).

Various studies have shown a positive relationship between attitude and organic food consumption (Ryan and Casidy, 2018; Zhou et al., 2013; Dean et al., 2012; Ha and Janda, 2012), indicating that the attitude-intention rationale prevails in green consumption settings. Studies on sustainable transportation, such as car sharing and using public transportation, reveal the influence of attitude (e.g. Peterson and Simkins, 2019; Onwezen, 2013). Several studies have been conducted in the context of green lodging and have observed that behavioural intention is positively influenced by attitude (e.g. Han et al., 2017; Verma and Chandra, 2019). Furthermore, studies on organic food or sustainably sourced food reveal that attitude is one of the main predictors for behavioural intention. Vermeir and Verbeke (2008) observed that attitude was the main predictor of behavioural intention when buying sustainable dairy products.

Based on the literature review and the notion that CO_2 emissions form one of the main topics in the discussion around environment protection, it is considered for the purposes of this research that ecological concerns have an effect on consumer intention to purchase food products, in particular dairy products, which are produced through environmentally friendly production methods, including CO_2 emission reduction.

Thus, the following hypothesis is proposed:

H1: Consumer attitude is positively related to intention to choose dairy products produced by companies which are committed to CO_2 emission reduction.

Subjective Norms (SN)

In the BRT model, subjective norms are a second determinant of behavioural intention. The term "subjective norm" is defined as "the perceived social pressure to perform or not to perform the behaviour " (Ajzen, 1991, p. 188). Persons close to the individual, such as close friends, family, colleagues *etc.*, can create a feeling of social pressure connected with the given behaviour. If the individual feels positive subjective norms, such as support from their peers, then the behaviour intentions are likely to be positive (Han et al., 2010; Taylor and Todd, 1995)

In the marketing and consumer behaviour context, several studies have documented a positive link between subjective norms and intention, including in relation to: sustainable transportation (Peterson and Simkins, 2018; Bamberg and Schmidt, 2003); organic food purchase intention (Argawal et al., 2019; Shin et al., 2018; Dean et al., 2012; Ha and Janda, 2012), pro-environmental lodging (Verma and Chandra, 2018; Han et al., 2015, Han et al., 2010), and environmentally conscious consumption (Khare, 2015; Moser, 2015; Tsarenko et al., 2013). Furthermore, many social campaigns have used social norms to shape the behaviour of the majority in pro-environmental consumer behaviour (Biswas and Roy, 2015; Yadav and Pathak, 2016; Verma and Chandra, 2018). Biswas and Roy (2015) found that peer influence and social recognition has the most significant impact on pro-environmental consumption behaviour. In the green lodging context, Verma and Chandra (2018) confirmed that subjective norms have a significant influence on green hotel visit intention among local consumers.

Based on the findings discussed, it is assumed in this research that, in the context of pro-environmental behaviour and heated debate on climate change over the course of recent months and years, the perception of pro-environmental behaviour of "significant others" will support the adoption of the behaviour by the individual/consumer. Thus, the following hypothesis is proposed:

H2: Subjective norms are positively related to the intention to choose dairy products from companies which are committed to CO_2 emission reduction.

Perceived Behavioural Control (PBC)

The term "perceived behavioural control" refers to "the perceived ease or difficulty of performing the behaviour" (Ajzen, 1991, p. 188), the presence or absence of resources to do so,

and reflects past experiences and anticipated obstacles. Perceived behavioural control reflects the possibility to conduct the behaviour by considering pre-conditions, such as the perception of the difficulty of performing the behaviour and an individual's control over the behaviour (Chan and Fishbein, 1993; Sparks et al., 1997). Examples in the pro-environmental behaviour context are found in a studies conducted by Chen and Tung (2014) who revealed that consumers' perceived behavioural control is the most indispensable factor in the TPB model. They go on to suggest that greater accessibility of green hotels will increase consumer intention to choose a green hotel for their stay. Shin et al. (2018) confirmed behavioural control as a factor for improving the predictability of intention to choose an organic menu at a restaurant.

In general, there are three main factors describing behavioural control:

- Access to resources needed to engage in the behaviour (Ajzen, 1991; Taylor and Todd, 1995).
- Focal self-confidence of the person with the ability to conduct the behaviour (Ajzen,1991; Taylor and Todd, 1995).
- Capability to control various factors of the actual behaviour (Han and Kim, 2010; Kim and Han, 2010; Tonglet et al., 2004).

There is a discussion in the literature about whether behavioural control includes non-motivational factors such as Ajzen's (1989) concept of resources and opportunities (Ajzen, 1989; Sarver, 1983), facilitating factors (Triandis, 1977), and action control (Kuhl, 1985), or whether the behaviour follows Bandura's (2002) concept of self-efficacy with focus only on internal control factors (Bandura, 1992). For the purposes of this research, non-motivational factors will be included. It is assumed that in addition to an individuals' belief in their capability to attain a goal through personal effort (Bandura, 1986) manifested in the self-confidence to conduct the behaviour and their own capability to control aspects of the behaviour, a clear limitation can be seen in the resources needed to engage in the behaviour, such as the accessibility/visibility of information. This makes it possible for the individual to opt for a dairy product produced in an environmentally friendly way when shopping in-store.

Many studies have shown that BC is positively linked with intention in various research contexts, such as recycling (Cheung et al., 2016), environmental concern and scepticism around green purchase behaviour (Albayrak et al., 2013), green hotels (Han et al., 2010, 2015; Chen and Tung, 2014; Verma and Chandra, 2018), organic foods (Zhou et al., 2013; Shin et al., 2018),

and green products in general (Moser, 2015). Onwenzen et al. (2013) confirmed the significant effect of behavioural control on intention in the context of environmentally friendly behaviour by using perceived control and perceived difficulty to control the behaviour.

Based on the literature, the following hypothesis is proposed:

H3: Perceived behavioural control is positively linked to intention to choose dairy products produced by a company which is committed to CO_2 emission reduction.

"Reasons for" and "reasons against" the behaviour

With the inclusion of "reasons for" and "reasons against" into the framework, the BRT shows a close relationship with other theories, such as sense making (*e.g*., Thomas, Clark, and Gioia 1993), psychological coherence (*e.g*., Nowak et al. 2000), and functional theorising (*e.g.,* Snyder 1992). The "reasons for" and "reasons against" help the individual to support their decision and to justify their subsequent actions, which promotes and protects their self-worth (Smith and Paladino, 2010). The "reasons for" and "reasons against" are qualitatively distinct constructs which influence the consumers' adoption decision (Claudy, 2015), take the product context as well as the general beliefs of the product into consideration (Tudor et al., 2007; Westaby et al., 2010), and help to understand different cognitive routes in consumer decision making.

Looking at organic food consumption, studies have found that health considerations are the main reason for consumers to opt for organic food consumption; whereas the lack of understanding/ awareness of the benefits of organic food are cited as the main "reasons against" consuming such products (Hughner et al, 2007). Consistently with the BRT framework, the current study argues that consumer reasoning has significant effects on attitude. It is assumed that consumers with strong reasons for or against are, respectively, likely to have a positive or negative attitude towards the behaviour. Environmental benefits (EBE) and trust (TRU) are described as "reasons for", while scepticism (SCM), image of dairy (IMD), other decision criteria (ODC), and purchase criteria for dairy (PCD) are defined as "reasons against". The following hypotheses have been developed:

H4.1: "Environmental benefit" as a reason for buying dairy products from manufacturers reducing their CO_2 emissions will positively influence consumer attitude towards the purchase.

H4.2: "Trust" as a reason for buying dairy products from manufacturers reducing their CO_2 emissions will positively influence consumer attitude towards the purchase.

H5.1: "Scepticism" as a reason against buying dairy products from manufacturers reducing their CO_2 emissions will negatively influence consumer attitude towards the purchase.

H5.2: "Image of Dairy" as a reason against buying dairy products from manufacturers reducing their CO_2 emissions will negatively influence consumer attitude towards the purchase.

H5.3: "Other Decision Criteria" as "reasons against" buying dairy products from manufacturers reducing their CO_2 emissions will negatively influence consumer attitude towards the purchase.

H5.4: "Purchase Criteria for Dairy" as "reasons against" buying dairy products from manufacturers reducing their CO_2 emissions will negatively influence consumer attitude towards the purchase.

4.5.2 Hypotheses related to the Norm Activation Model

In the NAM, personal norms based on an individual's personal value system are considered to lead to moral behaviour. For the purposes of this research, the environmentally friendly behaviour associated with choosing dairy products produced in a way that reduces CO_2 emissions are considered as a highly normative situation – protecting the environment and acting responsibly for future generations.

Awareness of Consequences (AC) and Ascription of Responsibility (AR)

Applying the NAM, personal norms are activated by awareness of consequences –"someone is aware of the negative consequences for others or other things one values when not acting pro-socially" (Steg and de Groot, 2010, p. 426) – and ascription of responsibility – "feelings of

responsibility for the negative consequences of not acting pro-socially" (Steg and de Groot, 2010, p.725). Following Stern et al. (1999) and Stern (2000), the mediator model of the NAM is especially suitable in the context of pro-environmental behaviour. Stern (2000) proposed the NAM as a partial mediator model and AC has an indirect and direct effect on PN. Regardless of whether the relationship is partially or fully mediated, prior research indicates that promotion of pro-environmental behaviour is most successful when raising awareness first, before focusing on AR and PN (Steg and de Groot, 2009).

Empirically, a number of studies working on pro-environmental behaviour have found that awareness of consequences and ascription of responsibility affect personal norms, which play an important role in determining behavioural intention and behaviour (e.g. Zhang et al., 2013; Chen and Tung; 2014, De Groot and Steg, 2009). Consequence awareness is also posited to be an antecedent of ascribed responsibility. People are likely to feel responsibility for negative consequences when they are aware of the negative consequences associated with not performing certain behaviours (Zhang et al., 2013). A person's intention to choose an organic menu is formulated by attitude, subjective norms, perceived behavioural control, and personal norms. Consumer intention to choose an organic menu is expected to positively influence their intention to visit a restaurant featuring organic menu items (Shin et al., 2018).

It is interesting to apply this model to consumer purchase intention related to dairy products produced in an environmentally friendly way through the reduction of CO_2 emission. On the one hand, CO_2 emissions are a hot topic in the market at the moment, which makes it reasonable to assume that people are aware of the consequences of pro-environmental behaviour in regard to CO_2 emissions. The question is whether the awareness of the CO_2 emissions problem leads to the ascription of responsibility and the feeling of obligation to act on it when purchasing low involvement products, such as dairy products. *Are consumers aware of the CO_2 emissions of companies producing dairy products? Are they aware, that this industry has a major impact on the CO_2 emissions problem?* If the consumer would like to act environmentally responsibly, it will be necessary to increase the time and effort spent on decision making in the context of low involvement products.

In the proposed research model, personal norms are expected to be activated by awareness of consequences and ascribed responsibility. This research uses the partial mediation model – it is

expected that AC has a direct effect on PN, as well as an indirect effect mediated by AR. The following hypotheses have been developed:

H6: Awareness of consequences of environmentally friendly production is positively related to the ascription of responsibility.

H7: Awareness of consequences of environmentally friendly production is positively related to the consumers purchase intention.

H8: Ascription of responsibility is positively related to personal norms.

Personal Norms (PN) and Attitude (AT)

Several studies support the extension of the TPB with moral norms and obligations in the context of pro-environmental behaviour (*e.g.,* Shin et al., 2018; Bamberg et al., 2007; Park and Han, 2014; Onwezen et al., 2013); however, there have been several discussions about the best fitting theoretical framework. Schwartz and Howard (1984) differentiate attitudinal concepts from personal norms by stating "[w]hereas other attitudinal concepts refer to evaluation based on material, social, and/or psychological pay-offs, personal norms focus exclusively on the acts in terms of their moral worth to the self" (Schwartz and Howard, 1984, p. 245). Furthermore, personal norms in the NAM are fully activated. Therefore, the NAM offers additional insights into personal norms and provides a construct which is clearly focused on moral considerations and does not consider other factors. Due to this, the NAM is the preferred choice for this research.

There is a question around whether personal norms directly influence purchase intention and serve as a predictor for attitude, and whether the relationship between personal norms and intention is mediated by attitude. As there are not many studies combining the NAM and attitudinal models, this researcher uses leanings from the extended attitudinal models as well as the combination with the NAM. In research on public transportation (e.g. Bamberg et al., 2007; Harland et al., 2007; Heath and Gifford, 2002), moral norms have been shown to be a predictor of pro-environmental behaviour. Studies on recycling behaviour show that moral norms impact attitude and behavioural intention. For example, Chen and Tung (2010) found that moral norms serve as a predictor of intention, whereas Kaiser's study (2006) about general conservation behaviour, including recycling, showed that moral norms are a predictor of intention and

attitude, or can even be a substitute for attitude. Chan and Bishop (2013) used different findings to test the role of moral norms in their research on recycling and found that moral norms can replace attitude in the model.

For the purposes of this study on CO_2 emission reduction and the purchase of dairy products, it is suggested that attitude and personal norms are distinct, but correlated factors, and personal norms are a predictor of attitude. It is assumed that personal norms and attitudes show discriminant validity, because personal norms describe a person's feelings of "moral obligation to perform or refrain from specific actions" (Schwartz and Horward, 1981, p.191) and refer to internalized norms and values of significant others, i.e. each person's own views about right and wrong, which have been learned throughout life (Schwartz, 1977). Attitude is defined as favourable or unfavourable cognitive evaluations, emotional experience, or behavioural tendencies of certain actions or situations (Blackwell et al., 2006). When comparing attitude with moral norms – reflecting an individual's feelings about whether a behaviour is inherent right or wrong – we refer to Manstead (2000) and assume discriminant validity between attitude and personal norms; therefore, it is hypothesised that personal norms are a predictor of attitude.

H9: Personal Norms are positively related to the attitude to choose dairy products from manufacturers reducing CO_2 emissions in the production process.

Personal Norms (PN) and Intention (IT)

Personal norms are defined as a person's feeling of "moral obligation to perform or refrain from specific actions" (Schwartz and Horward, 1981, p.191). Since environmentally responsible actions occur where individuals benefit others without direct own advantage from engaging in such behaviours, pro-environmental behaviours are generally regarded as a vital part of pro-social behaviour (De Groot and Steg, 2009). Thus, personal norms have been widely applied when predicting people's pro-environmental behaviour (Han et al., 2016).

The norm activation framework appeared to be successful in explaining diverse types of pro-environmental intentions/behaviours, including environmentally friendly travel, energy saving, organic food, waste separation (Bamberg et al., 2007 (environmentally friendy travel/car use); Liu et al., 2018 (reduced car-use); Gräling et al., 2013 (collective pro-environmental behaviour), van der Werff and Steg, 2015 (energy saving); Han et al., 2015 (environmentally friendly

lodging), Zhang et al. 2018 (environmentally complaint intention); Zhang et al., 2013 (electricity saving behaviour); Wang et al., 2019 (waste separation)).

When applied in the context of food purchase intention, different results are observed. Thøgersen (2002) has examined the role of moral issues in the context of organic food purchase in Denmark. He found that personal norms influence consumer choice between organic and conventional wine after controlling for attitudes and subjective norms. In another study, personal norms were the most important predictor of respondents' ratings of their purchase frequency of various organic foods (Thøgersen and Ölander, 2006). In a country, such as Denmark, where organic food consumption is more familiar and available than in other countries, there is a clear indication that personal norms increase the prediction of organic food choices, more than attitudes, subjective norms and behavioural control. Other authors state that motives, such as health, taste, and food safety, are more relevant when purchasing food products (e.g. McEachern and McClean, 2002; Magnusson et al., 2001). Authors like Schäfer (2002) found out that altruistic motives are important when transferring occasional customers into committed customers. Baker et al. (2002) point out that altruistic values (responsibility for other creatures and belief in nature) are important in Germany.

There are a few studies that found that self-interest and pro-social motives play a role in the pro-environmental behavioural context and integrated different approaches (Han et al, 2015; Han et al., 2017; Shin et al., 2018). These studies confirm the positive relationship between personal norms and behavioural intention. However, the strength of the relationships, attitude - behavioural intention and personal norms – and behavioural intention vary in these studies. In a recent study, Shin et al. (2018) explored consumer intention to choose organic menu items at a restaurant and their intention to visit restaurants featuring organic items. The findings indicate that the pro-environmental behaviour of organic dining is mainly driven by one's personal value system, as well as expectations of significant others (Klöckner and Matthies, 2004). Shin et al. (2018) showed that attitude is the strongest indicator for behavioural reasoning when deciding to opt for organic menu items in a restaurant, whereas Han et al. (2015) found that in the context of eco-friendly lodging, moral norms played the most important role. Conversely, Han et al. (2017) found that personal norms are a less significant factor influencing behavioural intention to participate in bicycle tourism compared to other self-interests, such as attitude, subjective norms, and perceived behavioural control.

Based on the available literature, there is a clear indication that including personal norms into the research model when predicting the purchase intention for dairy products produced by a company focusing on CO_2 emission reduction will improve the predictive power of the model. Therefore, for the purposes of this research, the following hypothesis is proposed:

H10: Personal Norms are positively related to the intention to choose dairy products from manufacturers reducing CO_2 emissions in the production process.

4.5.3   Moderating variables – gender and education

Two demographic factors that have been found to influence environmental attitude and pro-environmental behaviour are gender and education level. Women tend to have less extensive environmental knowledge than men but they are more emotionally engaged, show more concern about environmental destruction, believe less in technological solutions, and are more willing to change (Fliegenschnee and Schelakovsky, 1998; Lehmann, 1999). Several studies support the positive effect of higher education on consumer concern about environmental quality and the motivation to engage in environmentally responsible behaviour based on greater awareness of potential damage (Lozano, 2006; Olli et al., 2001). However, other studies suggest no or only little evidence for the correlation between education level and the different variables leading to purchase intention (i.e. Ek and Sonderholm, 2008; Ayalon et al., 2014).

In this research, we will also test the impact of environmental orientation in the context of gender and education level.

4.5.3.1 Moderating variables – gender/sex

Sustainable consumption has been subject to increasing research attention. Behavioural differences between genders have been observed in several studies. Overall, gender is seen as an important socio-demographic predictor for sustainable consumer behaviour and it has been confirmed that women act in accordance with those concerns when making their purchase decision.

Examples can be found in several studies. Bord and Connor (1997) found that women report a higher perceived vulnerability to risk from global warming and hazardous waste and are more

concerned about the negative outcome of environmental damage than men. Mainieri et al. (1997) showed similar results and indicated that women report significantly more participation in general environmental behaviour and specific green consumption. Zelezny et al. (2000) studied gender differences across 14 countries and found significant gender differences in environmental attitudes and behavioural patterns within countries, with women being consistently more pro-environmental than men. Berenguer et al. (2005), Vitell (2003), and Roberts (1996), examined the gender effect and revealed that women are more concerned about environmentally responsible consumption and environmental issues (Mostafa, 2007). Stern et al. (2005) found that female adolescent consumers show a significantly higher degree of environmental attitude, environmental concern and perceived seriousness of environmental problems, responsibility, peer influence, and green purchasing behaviour. Value orientation, claiming that women focus more on values that emphasise the environment and ecosystem, is another approach to explaining the gender difference in environmental concern (Stern et al., 2005). Luchs and Mooradian (2012), which indicates that women are more likely to express concerns about the broader impact of consumption and to act upon those concerns. Scannel and Gifford (2013) found that in the context of climate change women show a higher level of change engagement. McCright (2010) conducted a study on the effect of climate change knowledge and concern in America and found slightly higher environmental knowledge and concern in women. Kaman (2009) found that female consumers in Hong Kong reported a higher degree of environmental attitude, environmental concern, perceived seriousness of environmental problems, perceived environmental responsibility, peer influence, and green purchasing behaviour than their male counterparts. Liu et al (2020) found that Chinese females show a stronger positive correlation between environmental knowledge and environmental attitude.

These examples show that the main body of literature supports the view that women have a higher degree of attitude, concerns and activity level in the pre-social and pro-environmental context. This higher interest and commitment of females to pro-social behaviour is often explained by the socialisation of females to value the needs of others, which is shown in a stronger ethic of care and more helpful and altruistic behaviour (Stern et al., 2005). An alternative to the gender socialisation perspective is the social role perspective – the idea that roles in society, such as employment status, homemaker status, and parenthood (Blocker and Eckberg 1997) play a role. Early research of Paul Morhai (1997) and newer research of

McCright (2010) suggests that gender differences in environmental concern exist due to gender socialisation rather than social roles.

Based on the available studies, this researcher adopts the hypothesis that gender will have an moderating effect on the purchase intention for dairy products produced under consideration of CO_2 emission reduction.

H11: Gender moderates relations in the research model with an effect on the consumers' purchase intention for dairy products produced by manufacturers committed to CO2 emission reduction.

4.5.3.2 Moderating variables – education level

Many studies have found that education is one important variable when it comes to expressing high levels of environmental concern and behaviour. Researchers suggest that more highly educated consumers are more concerned about environmental quality and are more motivated to engage in environmentally responsible behaviour than less educated consumers in different contexts, including recycling, energy saving, water saving, and green energy *(i.e,. recycling:* Callan and Thomas, 2006; Duggal et al., 1991; Ferrara and Missios, 2005; Reschovsky and Stone, 1994; Smith, 1995; *water:* Berk et al., 1993; Gilg and Barr, 2006; *energy saving:* Mundaca et al., 2010, Poortinga et al., 2004; *green energy:* Rowlands et al., 2003). When researching food choices, such as organic and eco-labelled food products, different authors reinforce this positive correlation (Blend and Van Ravenswaay, 1999; Bellows et al., 2008; Monier et al., 2009; Zepeda and Li, 2007). De Silva and Pownall (2014) indicate that people with college education are even sacrificing financial well-being for the improvement of environmental quality. Others, like Torgler and Gracia-Valinas (2007), stress that it is not only formal, but also informal education and political interest, which is important when explaining pro-environmental attitudes. It has been suggested that a possible reason for the correlation is that more highly educated people may have a greater awareness of the external effects, such as potential damage, and are more concerned about social welfare (Loanzo, 2006; Olli et al., 2001; Meyer, 2015). Schlegelmilch et al. (1996) indicated that highly educated individuals seem to possess a higher level of environmental knowledge, which is translated into pro-environmental behaviour.

However, other studies especially in the food industry report no positive association between pro-environmental attitudes or behaviour and the education level of an individual (*green electricity:* Ek and Sonderholm, 2008; *recycling:* Ayalon et al., 2014; *eco labelled food:* Wessels et al., 1999; *organic food:* Millock and Nauges, 2014). Even though this study deals with CO_2 emission reduction in the food industry, it is not considered to be part of the organic food context. Behavioural intention to buy organic food is often motivated by self-interest behaviour, whereas CO_2 emission reduction in the production process is considered to be driven by altruistic motives.

Other researchers have shown that more highly educated individuals trust eco-labels and consider them important, while also reporting lower purchase intention and behaviour (Teils et al., 2008; Johnston et al, 2001; Thompson, 1998; Thomson and Kidwell, 1998). Grafton (2014) found a negative association between education and water consumption.

Even though the literature shows inconclusive results, the majority of researchers assume a positive relationship between education level and pro-environmental behaviour when it comes to pro-environmental behaviour. Therefore, the researcher of this study adopts the hypothesis that a higher level of education has a positive effect on the purchase intention of dairy products produced under the consideration of CO_2 emissions reduction.

H12: Consumers' education level moderates relations in the research model with an effect on the consumers' purchase intention for dairy products produced by manufacturers committed to CO2 emission reduction.

4.6   Research Model

Based on the overall discussion in Section 4.5, the conceptual framework for the present study is advanced in Figure 4.6.
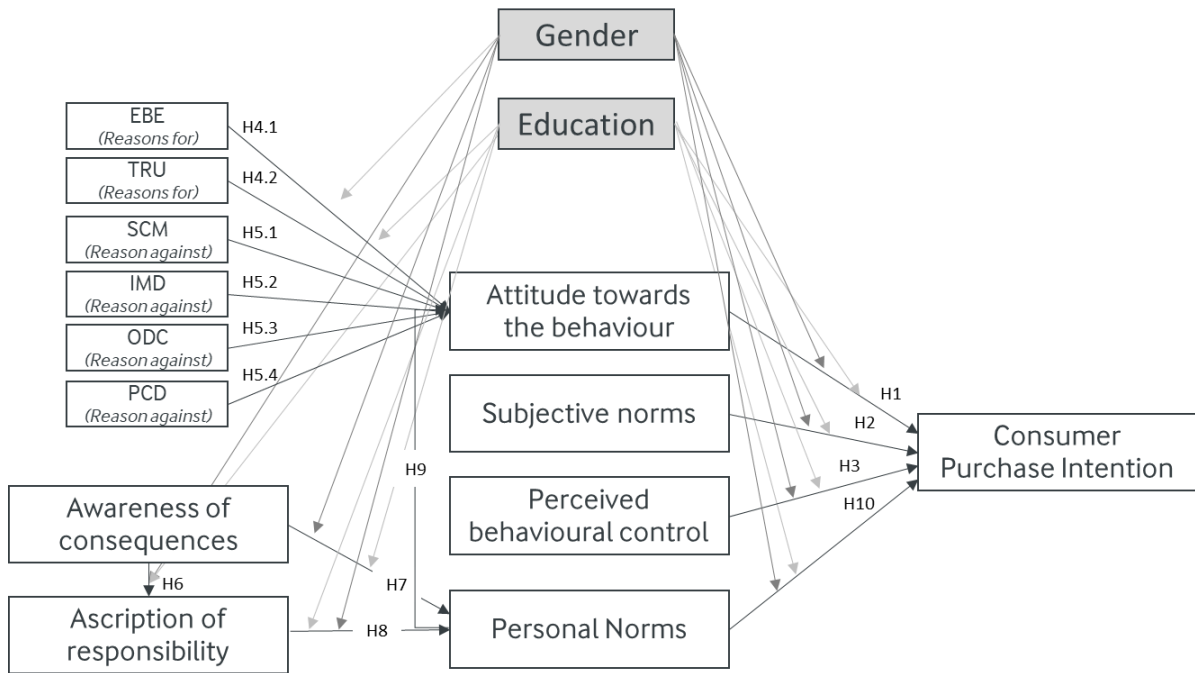
Figure 4.6 Research Model

Chapter 5: Research Methodology

5.1 Introduction

In Chapter 4, the theoretical framework was proposed and the hypotheses developed. In this chapter, the research design will be presented. The research design is the operational framework for conducting a research study to assure that the required data can be collected and analysed to answer the research question, in this case: "How to improve consumer contribution to the CSR agenda? Utilising the example of CO_2 emission reduction in the dairy industry" (Sekaran and Bougie, 2010; Sanders et al., 2016).

In this chapter, the researcher introduces the chosen research design and elaborates on the different steps, from research philosophy to data collection and analysis. Table 5.1 shows a summary of the research design with the different steps, which will be discussed in detail in this chapter.

Research design - Summary		
Philosophical Perspective	Ontology and epistomology	objectivism/positivism
Theoretical framework	Underlying theoretical framework	Behavioural Reasoning Theory (BRT) Norm Activation Model (NAM)
Research Design and Strategy	Research approach	deductive
	Data collection	survey, quantitative approach
Research Methodology	Research methodology	cross-sectional study
Data Sampling	Target population	consumer 18-64 years-old in Germany
	Sampling frame	online panel
	Sampling technique	non-probability/quota sampling
	Samplin size	750

Table 5.1 Research design summary

5.2 Philosophical perspectives – ontology and epistemology

In order to develop knowledge, it is important to clearly define the system of beliefs and assumptions underpinning a methodological choice, research strategy, data collection technique and analysis procedures (Saunders et al., 2016).

Philosophical perspectives are related to assumptions about the nature of reality and existence (ontological assumptions), assumptions about human knowledge (epistemological assumptions) and the extent of influence of the researcher's values in the research process

(axiological assumptions) (Saunders et al., 2016). Distinct sets of assumptions about ontology and epistemology have been developed and are considered as paradigms in the context of academic research (Easterby-Smith et al., 2016).

Burrel and Morgan (1979) consider that ontological considerations are concerned with the reality of the phenomenon that is being investigated. There are two contrasting views discussed in the academic literature – objectivism and subjectivism (Saunders et al., 2016).

Objectivism is grounded in the idea that the social world exists externally, independent from human actors and is associated with the epistemological position of positivism, assuming that the properties of the external social world can be measured through objective methods (Saunders et al., 2016). Hence, positivism is concerned with the explanation of human behaviour (Bryman and Bell, 2015). According to the positivist approach, knowledge can only be generated when the phenomenon is confirmed by senses, which means that it is necessary to translate concepts into measures and generate empirical evidence (Bryman and Bell, 2015). Following the principle of phenomenalism only knowledge derived by evidence can be warranted as knowledge, which this research aims to prove by surveying the ethical purchase decision process of consumers. The method of quantitative research is often associated with positivism and is used to determine certain facts or uncover patterns in the research based on predetermined and highly structured data collection. In the quantitative research approach, the phenomenon is reduced to the simplest elements: formulating hypotheses and testing them with the goal to look for facts, causality, and fundamental laws (Sekaran and Bougie, 2011).

Subjectivism assumes that reality is constructed through social interactions in which social actors create partially shared meanings and realities (Saunders et al., 2016) and is often associated with the epistemological assumptions of social constructivism. Social constructivism is concerned with the understanding of human behaviour. The observed social phenomena are assumed to be context rich (Godfrey and Hill, 1995) and in a constant state of flux and revision, which determines the data collection methods (Saunders et al., 2016). Qualitative research is often associated with this interpretive philosophy because the researcher has to make sense of the subjective and socially constructed meanings expressed about the phenomena studied (Saunders et al., 2016).

This research aims to develop an understanding of how to improve consumer contribution to the CSR agenda, especially CO_2 emission reduction that companies have implemented and are

in an ongoing process of optimising. The ontological considerations are defined as objectivism because the reality of the phenomenon – the strategies and activities the companies have defined to reduce the CO_2 emissions - exist externally to consumer behaviour and the objective of this research is to understand the attitude and behavioural motivation of consumers to support the companies' market approach by purchasing their products.

The framework developed for this research is based on strong theories, the Behavioural Reasoning Theory and the Norm Activation Model, which have been tested in multiple studies in the context of building consumer behavioural purchase intention and purchase decisions. Following the literature review above, both models have been applied to consumer ethical decision making and to environmentally friendly consumer behaviour. However, to the best of the authors knowledge, they have not been combined to improve the understanding of consumer behavioural intention in the context of CO_2 emission reduction when purchasing low involvement products like dairy products. Based on the models and the existing literature, hypotheses and measurable concepts for the consumer contribution to CO_2 emission reduction have been developed.

Consequently, the positivist approach has been applied with the aim of gathering factual information through observations and measurements in order to provide generalisable findings and provide the basis for the development of laws and contribute to existing theories. (Bryman and Bell, 2015). In other words, it has been applied to gather factual information around whether the combined application of the BRT and the NAM can help to develop a better understanding of consumer behavioural intention to include CO_2 emission reduction considerations in their purchase decision when buying low involvement products, such as dairy products.

In accordance with the objectivist view and the positivist approach, this research follows the deductive approach – hypotheses are defined based on the strong theoretical background of the BRT and the NAM and confirmed or rejected based on the research findings.

Following on from the discussion above, this researcher assumes that the data to be collected to explore environmentally friendly consumer behaviour reflects an external reality. CO_2 emission reduction is greatly discussed in politics and society, globally and nationally, and is increasingly being considered in the business models of companies, including as part of the production process and provisioning of services. Companies consider CO_2 emission reduction in their CSR reports and have started to use it when promoting their products and services. This

study's objective is to evaluate whether and how consumers perceive the approach of companies to CO_2 emission reduction, and the extent to which consumers consider CO_2 emission reduction in their purchase decisions for low involvement products, such as dairy products. The aim is also to develop an approach to improve the consideration of CO_2 emission reduction in the consumer purchase decision process. The main goal for companies is to include consumers as stakeholders in their CO_2 emission reduction approach. This enables companies to develop a competitive advantage and encourages them to establish strategies to help them achieve the ambitious global CO_2 emission reduction goal.

Therefore, this researcher views the ethical reality as separate from the individuals making the decision; consumers are confronted with the reality, rather than influencing it (Bryman and Bell, 2015). Based on the external reality, consumers make decisions on whether to purchase products that are produced with CO_2 emission reduction in mind. They face an ethical dilemma, which is defined as a conflicting situation in the decision making process. In summary, this research is based on the ontological position of objectivism and the epistemological position of positivism.

5.3 Research design and strategy

The research design is the general plan for answering the research question (Bryman and Bell, 2011). It guides the systematic collection of data and assures that the philosophical orientation, the purpose and aim of the research (Malhotra and Birks, 2007; Sekaran and Bougie, 2012), are aligned and are followed throughout the whole process. The majority of research designs applied in business and management can be divided into the following three categories: experimental, survey and case study (Saunders et al., 2016) and can be described by two different time horizons – longitudinal and cross-sectional (see table 5.2).

	Experiment	Survey	Case study
Primary use	Mainly used to study causal links to explain whether a change in one independent variable produces a change in another dependent variable (Hakim, 2000) - highly controlled.	Collection of a large amount of data from a sizeable population in a highly structured and economical way.	Used to gain a rich understanding of the context of the research and the processes being enacted (Morris and Wood, 1991). A case study involves an empirical investigation of a particular contemporary phenomenon within its real life context using multiple sources of evidence.
Dominant research paradigm	Positivist	Positivst	Positivist or interpretivist
Purpose of research	Mainly used for exploratory and explanatory research. Most frequently used to answer 'how' and 'why' questions.	Mostly used for exploratory and descriptive research Most frequently used to answer who, what, where, how much and how many	Used mainly for exploratory and explanatory research.
Research approach	Quantitative	Quantitative	Qualitative/quantitative
Time horizon	longitudinal or cross-sectional	longitudinal or cross-sectional	cross sectional

Table 5.5.2 Research designs in business and management research (adapted form Saunders et al., 2016 and Bryman and Bell, 2015)

The experimental design is used to examine cause and effect relationships between the independent and dependent variables in a highly controlled set up. The survey design provides the possibility to explore or describe relationships between different variables based on the collection of a large amount of data in a structured way. When probability sampling is used it is possible to generate findings that are representative of the whole population in an economical way (Sander et al., 2016). A case study is used for in-depth investigations of a contemporary phenomenon within its real-life context by using multiple sources of evidence (Saunders et al., 2016). In contrast to the experimental design, there are no clear boundaries, so the context is not highly controlled (Yin, 2013). The three research designs can be conducted as cross-sectional or longitudinal research. A cross-sectional approach studies a particular phenomenon (or phenomena) at a particular time and gives a "snapshot" of the situation, whereas the longitudinal research gives the possibility to observe change and development by observing people or events over time (Saunders et al., 2016).

This research follows the ontological position of objectivism and the epistemological position of positivism. In line with the philosophical perspective, a survey research design is applied, which provides the possibility to explore and describe consumer attitude and motivations driving their behavioural intention to consider CO_2 emission reduction by companies in their

purchase decisions. Supported by evidence based on quantification in the collection and analysis of data, the survey aims to explore whether combining the BRT and the NAM helps to improve the predictive strength of consumer behavioural intention when CO_2 emission reduction is considered in the purchase decision. The developed framework contains analytical constructs that are applied to examine the collected data (Bryman and Bell, 2015), empirically test the hypotheses, and put forward results and conclusions that can be evaluated as generalisable knowledge (Saunders et al., 2016). Exploring the relationship between the different variables of both models will help to provide a set of recommendations for practitioners, policy makers and academia (Saunders et al., 2016) on how to improve consumer contribution to the CSR agendas of companies, especially dairy companies, when promoting dairy products produced with investment into the reduction of CO_2 emissions.

The decision for the quantitative research approach is supported by the majority of studies dealing with ethical decision making. These apply a quantitative approach, referring especially to self-reported surveys (Auger and Devinney, 2007). Some researchers, like Carrington et al. (2014), however, argue that the use of quantitative research designs fall short when dealing with complex ethical consumption behaviour. The authors' argument is that the complexity of ethical consumption cannot be captured (DePelsmacker et al., 2005; Freestone and McGoldrick, 2008; Shaw et al., 2006; Szmigin et al., 2009), that the use of self-reported surveys can increase the social desirability bias (Carrigan and Attalla, 2001), and that surveys are more suitable to verify theory (Deshpande, 1983). In consideration of these factors, for the purposes of this research, the following actions are taken to improve the quantitative approach:

1. The complexity of ethical consumption is reduced using the strong theoretical background offered by the existing research in the field (see Chapter 3). The research builds on the BRT and the NAM theories which are considered to be a strong foundation for the quantitative research. Numerous studies have applied the theories in an ethical context (*e.g*. Diddi et al., 2019; Tandon et al., 2020; Bamberg et al., 2007; Gärling et al., 2003; van der Werff and Steg, 2015; Han et al., 2015; Zhang et al. 2018; Wang et al., 2019) and the results have been used to define the quantitative approach for this research.

2. Social desirability bias is a challenge in ethical consumer research. Social desirability bias is defined as the "systematic tendency to respond to a range of questionnaire items on some bias other than specific item content" (Paulhus, 1991, p.17). This means that the response is determined not only by specific item content, but also by a combination of factors.

Especially in the ethical context, this is of interest because statements can often be defined as "good" or "bad" and respondents like to be perceived in a "good" way (DeMaio, 1984). There are different methods to reduce social desirability (Krumpal (2013), which will partly be applied within this research. Krumpal (2013) highlighted that social desirability bias in surveys, especially sensitive surveys, can be reduced by: (a) increasing survey anonymity; (b) decreasing the respondents' concern regarding truthfulness risks; (c) implementing social desirability scales; (d) increasing awareness of the survey importance; *and* (e) reducing interviewer or bystander presence bias. For the purposes of this research, it is argued that social desirability is not an influencing factor as the topic of company CO_2 emission reduction is not a sensitive topic for consumers and does not affect them personally. Furthermore, the anonymity of an online survey leaves the respondents with the possibility to answer in privacy, without the presences of an interviewer or another person who could potentially influence the social desirability bias. There is also no truthfulness risk to be expected for the respondents. Therefore, this researcher considers that the parsimony of the research is more important than implementing the social desirability scale.

3. This research aims to verify existing concepts as it is based on strong theory as discussed under point 1. above.

Based on the strong theoretical grounding of this research and the researcher's evaluation of the social desirability issue in the context of consumer purchase decision making processes when dealing with CO_2 emission reduction of companies offering dairy products, a quantitative survey is considered to be the most appropriate way to answer the research question.

Survey

In line with the chosen quantitative survey approach, this research uses a self-administered internet-mediated questionnaire. Based on the strong theoretical grounding of this research, a standardised questionnaire with pre-determined response categories has been developed.

In order to ensure the questionnaire is a feasible length, it has been set to around fifteen minutes. Based on the experience of the researcher and the literature, this length is deemed reasonable enough to achieve an acceptable response rate. To map the complex topic in a manageable and

interesting way for the respondents and keep within the time frame, the questions have been simplified and different tools have been used to improve their clarity, e.g. break the statement visually into different blocks, reduce the repetition of long but important segments of text by aligning the statements. A pre-test has also been conducted to ensure that it is possible to keep to the survey time frame.

To understand consumer consideration of CO_2 emission reduction in their purchase decisions, a cross-sectional study has been chosen as the most suitable approach. The aim is to: (1) clearly describe the actual situation at a point in time based on the chosen theories; (2) find out whether the chosen theories help to improve the prediction of consumer purchase intention; *and* (3) define the main motive influencing the purchase decision. Based on this analysis, recommendations for the industry will be developed to improve consideration of CO_2 emission reduction in the consumers purchase decision for low involvement products, such as dairy. The interviews have been conducted in a 4-week time frame, however, additional weeks have been used to optimise the response quality and fulfil the quotas. All in all, the fieldwork has been conducted between December 2020 and February 2021.

5.4 Research methodology

The survey has been conducted at one point in time, often used for the survey strategy (Easterby-Smith et al., 2008; Robson, 2002). The aim of this study is to provide a "snapshot" of the situation to develop a better understanding of the actual status and improve the understanding of consumers involvement in environmentally friendly purchase decisions when purchasing low involvement products, such as dairy products, and to develop recommendations to improve the consumer contribution to the CSR agenda of companies to reduce CO_2emissions. Dairy companies have a clear CSR commitment to reduce CO_2 emissions but have only recently started to communicate this goal and their contribution to it to consumers. This means that only limited information is directly available to consumers when purchasing dairy products. To the best of the researcher's knowledge, only a few big dairy companies have started to communicate their CO_2 emission reduction commitment on the product itself or in their advertising. One example is Arla amba, one of the leading dairy companies in Europe, which has recently started to communicate its CO_2 reduction commitment on its milk cartons in Sweden and Denmark. The question is, whether the consumer understands the connection

between the CO_2 emissions contribution communicated on the milk cartons and whether this communication has an impact on the consumer purchase decision. Besides, to the best knowledge of the researcher, this is the first trial of a dairy company to directly communicate CO_2 emission reduction on their product packages. Examining purchase intention over time or exploring the final purchase decision would make more sense if there were a more prevalent connection between communication of CO_2 emission reduction and low involvement consumer goods in the market. Moreover, cross-sectional studies are known for their representativeness and low response bias compared to longitudinal studies (Malhotra and Birks, 2017). This is due to the exit of participants over time and lower attention rates of participants over the different survey waves in the latter (Malhotra and Birks, 2017). Based on the discussion above, the researcher considers that providing an evaluation of the actual view on and consideration of CO_2 emission reduction when purchasing dairy products will support the industry with valuable insights into promising communication possibilities as well as contribute to knowledge by evaluating CO_2 emission reduction in the context of the purchase decision for low involvement products.

5.5 Data Sampling

To meet the objective of this research, it is important to ensure that inference can be made between the sample participants and the wider population.

Data sampling is a fundamental element of marketing research and is used when it is impractical to survey the entire population and/or constrains in time and budget prevent researchers from surveying the entire population (Bryman and Bell, 2011). To define a sample, it is necessary to identify an appropriate target population, and then select a subset that matches both the purpose and the design of the research.

In this research, the steps of sampling design from Malhotra and Birks (2017), shown in Figure 5.1, have been adopted.
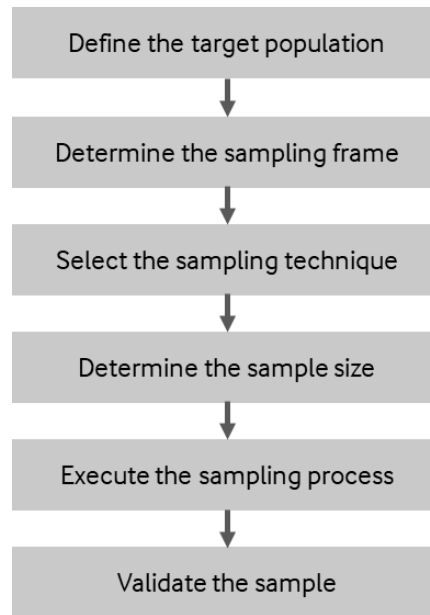
Figure 5.1 Sampling design adapted form Malhotra and Birks (2017)

Step 1: Define the target population

For the purposes of this study, the target population has been defined in terms of sampling elements, sampling units, geographical boundaries, and time. The sampling units and elements are adult consumers aged between 18 to 64 years who are responsible/partly responsible for grocery shopping. In addition, there must be at least one person in the household consuming animal based dairy products. The geographical boundary is that the consumer must live in Germany. The research was conducted in the time-period between December 2020 and February 2021. The data was collected via an online panel. After different quality checks, replacement interviews had to be conducted and were finished by the end of February 2021. The rationale behind the use of this cross-section of the population stems from: a) the familiarity of the consumers with the product category of dairy products; b) their awareness of CO_2 emission reduction; c) their involvement in the decision around what to buy for the household; *and* d) purchase of animal based dairy products, because at least one person in the household had to consume these products.

Step 2: Determine the sampling frame

 For the purposes of this research, an online panel from Qualtrics was chosen as an appropriate sampling frame for the following reasons: (1) an online panel provides access to a readily

available, wide cross section of the German consumer base, which can be reached in a short time period and at a reasonable price. (2) Qualtrics is considered to be a professional online panel used for business and academic research. Qualtrics invests in ensuring the quality of their online panel participants and market research data, and matches the participants against the defined target population. Furthermore, there is a general acceptance in academia of the use of online panels for academic research. In recent years, research has shown that the usage of online panels has not been limited to any area of management scholarship, and they can be used and published by macro and micro scholars (Porter et al., 2019).

There are limitations linked to choosing online panels, which have already been considered, mainly centred around the representativeness of the data. Not all individuals who fall into the target population are part of the online panel, which can lead to a sampling frame error (Malhotra and Birks, 2017). Nevertheless, this researcher relies on the quality of the Qualtrics online panel, which is often used for academic research and is well-known for its standard of high quality. Age and education quotas have also been used to help ensure that a representative sample of the target population is achieved.

For the purposes of this research, the benefits of aiming for a sample size of 750 respondents within a short time period and with a limited budget and in the end conducting 791 online-interviews to assure the representativeness of the data regarding age and education, are considered more important than giving all individuals in the target population a chance to participate in the online panel. Incentive bias (Ray, 2001, Groves et al., 2007, Dillman, 2011) is not considered to be an issue given the use of a professional online panel, which is often used in academic and business research. Moreover, sampling error has been reduced through screening of age groups and education levels in order to satisfy the criteria of the target population (Malhotra and Birks, 2017).

Step 3: Select the sampling technique

The following two methods are often discussed in relation to selecting a population sample for a survey, namely; probability or non-probability sampling (Bryman and Bell, 2015). The probability sampling method provides individuals within the target group with a known, predetermined and non-zero chance to be selected. In a non- probability sample, the researcher purposefully selects the participants according to their subjective judgement based on the aim of the research. The participants do not have a predetermined chance of inclusion (Malhotra

and Birks, 2017). Using a probability sampling technique gives researchers the opportunity to achieve representativeness (Aaker et al., 2007). Looking at the different sampling techniques in Figure 5.2, a clear differentiation between the non-probability and probability sampling is introduced. However, in social science tailored versions matching the research design are also applied (Fricker, 2008).
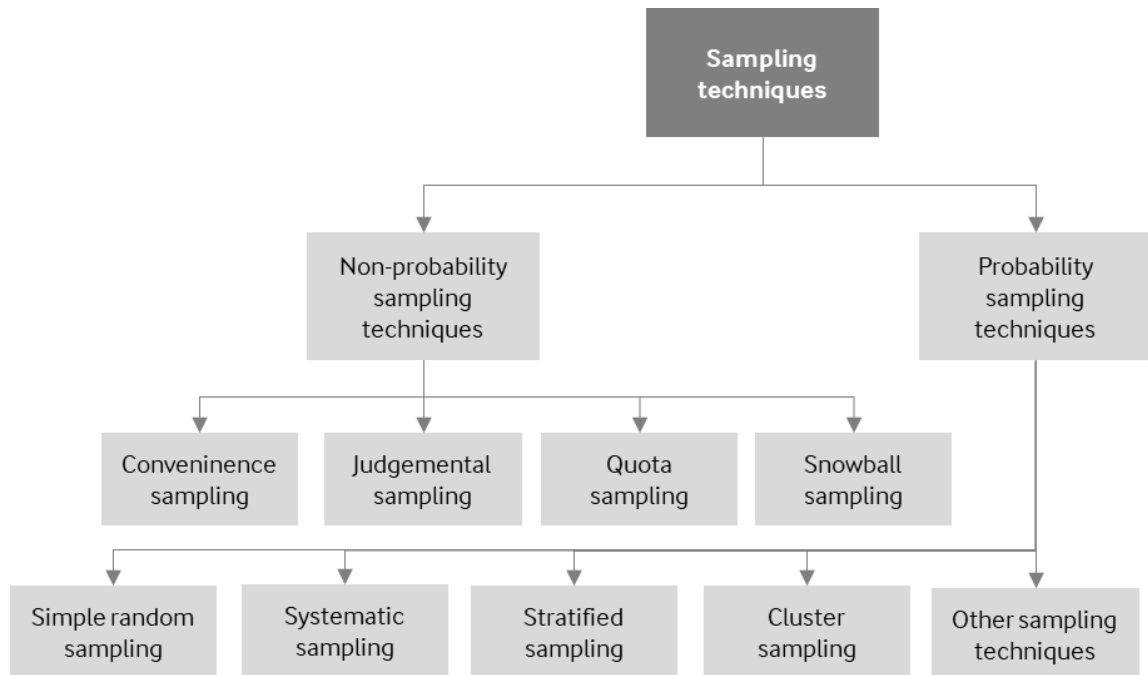
Figure 5.2 Sampling techniques adapted from Bryman and Bell (2015)

The main criteria for choosing the sampling technique for this research involved considerations about the target population, sampling frame, costs and time, as well as the possibility to reach representativeness of the sample. Based on these considerations, a non-probability sampling technique using quota was used. The sample was drawn from the online panel Qualtrics, offering a representative consumer panel for the German market. In the sampling frame, the online panel assigned a unique identification number to each member of the database and randomly selected the respondents for the study. This meant that each online panel member in an age group was chosen independently of other criteria and each panel member had the same chance to be selected. The panel sample was drawn randomly from the target German population aged between 18 and 64. To achieve representativeness within the planned targeted

sample size of 750, a stratified sampling technique is applied. Qualtrics randomly chose respondents until the sample size was reached. Following this, the developed quota defined as control categories of population elements, in this case age and education, were applied. The quota were assigned in accordance with the proportions of the selected characteristics within the population. The stratification process ensured that the composition of the sample was the same as the composition of the German population with respect to the characteristics of interest – age and education (Malhotra and Birks, 2017). The gender split in respective age groups within the German population was also represented. Participants were contacted via email, which is considered personal information. This provided assurance that the questions were being answered by the chosen sample participants and no one else.

The biggest advantage of the chosen sampling technique was that it offered the possibility to generalise the findings of the analysis, meaning it offered generalisability (Malhotra and Birks, 2017; Sekaran and Bougie, 2010). To ensure that generalisability can be achieved, a suitable sample size has to be applied, which will be discussed in the next section.

Step 4: Determine the sample size

A sample size is the actual number of subjects that must be studied to represent the characteristics found in the chosen population. There are two options with respect to determining the sample size – statistical techniques or ad-hoc methods (Aaker et al., 2007). For this research an ad-hoc method was chosen. The following factors were considered to determine the sample size: (1) the nature of the research; (2) the proposed analytical technique; (3) the rule of thumb for determining the sample size; (4) the number of variables; (5) sample sizes used in similar research; (6) time and cost constraints; *and* (7) the accuracy of the results (Aaker et al, 2007; Sekaran and Bougie, 2010).

One of the main considerations regarding the sample size of this study was the usage of the Partial Least Squares method (explained in detail in Hair et al., 2017). Hair et al. (2017) recommends that research satisfy the following minimum requirements: (1) 10 times the largest number of formative indicators used to measure one construct; *or* (2) 10 times the largest number of structural paths directed at a particular latent construct in the structural model. As a rule of thumb, Chin (1998) recommends the use of 10 or more cases per predictor in a study. Kristensen and Eskildsen (2010) provide the general recommendation that a sample size of

around 250 is, in general, sufficient for research studies that employ the Partial Least Square method.

Looking at these guidelines, this study includes only reflective indicators, and the maximum number of paths is 18. In accordance with Hair et al.'s (2017) argumentation, this equates to a minimum sample size of 180, which this research fulfills. Another important consideration for determining sample size is the planned analysis. In order to develop valuable insights, the researcher needs to analyse at least 30 answers for the different sub-samples (Saunders et al., 2016). The decision criteria of timing and the budget limits the number of interviews.

For the purposes of this research, the researcher decided to aim for a sample of 750 valid interviews and received 791 valid interviews due to the necessity to recruit additional respondents because of some challenges with the data quality and the selected quotas. With the use of quota, the researcher ensured representativeness in terms of gender, age and education. Four age groups were defined – the smallest group (18-24 years old) includes > 90 interviews, which means that it is possible to sub-divide the groups into 2 or 3 categories for different analyses, if necessary. Three educational groups were defined – the smallest group included 124 respondents. The gender groups included 400 females and 391 males.

The sample of 791 valid interviews makes it possible to use mulitvariate techniques for the analysis and gives the researcher the opportunity to analyse different segments and sub-groups within the sample. The research sample size has been discussed with experienced academics and evaluated as acceptable for a national research study.

Using an online panel and quota sampling ensured that the researcher received a data set of at least 750 valid interviews and that the defined target groups and quotas were achieved. Therefore, it is not necessary for the researcher to calculate the incidence and completion rate. The following two statements were used for screening purposes: (1) the consumption of milk based dairy products of at least one person in the household; and (2) the responsibility/or partial responsibility of the respondents for household grocery shopping. The researcher only wanted to include respondents who had a personal interest in buying milk based dairy products and who had the possibility to influence the household purchase decision for dairy products.

During January and February, many consistency checks of the replies were conducted by the researcher to assure data quality. Answers from respondents who spent less than 6 minutes on the questionnaire (the duration of which was set to around 15 minutes) and straight-liner responses for selected questions were removed from the sample and replaced by Qualtrics. 9.754 respondents entered the study, 993 interviews were recorded as valid interviews by the system. After working on the data quality for several weeks, this amounted to 791 usable interviews, fulfilling all of the researcher's set quota and requirements.

Step 5: Execute the sampling process

Sampling frame – quota age

The researcher decided to focus the sample population on consumers buying dairy products who were responsible or partly responsible for the purchase of household groceries. The age range was set from 18–64 years-old. During the soft launch, the researcher observed that the data quality for respondents over 65, especially for individuals over 70 years, was much lower than for the other age groups. The main difference was the lower differentiation between the answers – more straight-liners than in the other age groups - as well as somewhat extensive time spent on conducting the questionnaire. Therefore, the age of the respondents was set to a maximum of 64 years and the quotas were aligned to this. The interviews from respondents aged 64 and over were deleted and a new quota scheme was established. The survey was restarted and all participants aged 64 and older were not considered in the data set. The applied quotas for the age groups are shown in Table 5.3.

Age group	% of German population *(in the chosen age range)*
18 – 24 year old	12.29%
25 – 34 year old	20.44%
35 – 49 year old	31.92%
50 – 64 year old	35.26%

Table 5.3 Quota - age groups (based on German population adapted from Eurostat by Qualtrics 2021)

Sampling frame – quota education

The second quota used was education level as shown in Table 5.4.

Education level was considered as the second quota for the research. The quota was based on the International Standard Classification of Education (ISCED). The following 3 categories shown in Table 5.4 were considered:

ISCED classification	Description	% of German population
ISCED 0-2	Primary and lower secondary education	16.473%
ISCED 3-4	Upper secondary and post-secondary non-tertiary education, short-cycle tertiary education	58.141%
ISCED 5-8	Bachelor or equivalent, master or equivalent, doctoral or equivalent	25.385%

Table 5.4 Quota – education (based on German population adapted from Eurostat by Qualtrics 2021)

Additionally, in order to achieve a representative sample, the researcher considered the associated gender spilt – the survey aimed to reach 48,873% male and 51,127% female respondents.

Sampling process:

The respondents were sampled via the Qualtrics' online panel, which is used for various academic and representative studies in Germany. They were contacted via email and screening questions were implemented to ensure that the questionnaire only reached relevant consumers according to the defined quota. The online panel assured that the interviews were conducted in accordance with the requirements of professional research –introduction and finalisation of the interview, research ethics, intensifying the respondents, and assuring the fulfilment of the quotas.

Step 6: Validate the sample

The general validation of the sample was done by the online panel. The researcher conducted further validation checks to assure the data quality. These checks will be discussed in more detail in Chapter 6. Valid responses obtained as part of the conducted interviews have been documented.

The representative sample for the German population used in this research is shown in table 5.5.

Gender *(# of respondents)*				
Male	**Female**	**Divers**		**total**
390	400	1		**791**
49,3%	*50,6%*	*0,1%*		
Age groups *(# of respondents)*				
18 - 24	**25 - 34**	**35 - 49**	**50 - 64**	**total**
100	158	249	269	**776**
12,9%	*20,4%*	*32,1%*	*34,7%*	
Education: ISCED *(# of respondents)*				
0 - 2	**3 - 4**	**5 - 8**		**total**
123	469	197		**789**
15,6%	*59,4%*	*25,0%*		

Table 5.5 Sample

5.6 Conclusion

Chapter 5 has introduced the chosen research design and has elaborated on the different steps involved, from research philosophy to data collection and analysis. This research has been based on ontological position of objectivism and the epistemological position of positivism. A quantitative survey, conducted via an online panel, was chosen as the research design. The researcher received 791 valid interviews based on the sample frame and requirements, which will be used for the further analysis. In the following chapter, data collection based on the questionnaire, its measurements and measures as well as the data cleaning will be discussed.

Chapter 6: Data Collection

6.1 Introduction

The questionnaire had three specific objectives (Malhotra and Birks, 2017):

1. the information needed to be translated into a set of specific questions that the respondents could answer, and which served the overall aim;
2. the questionnaire needed to motivate involvement, participation and questionnaire completion, and engage the respondents; *and*
3. the questionnaire needed to minimise response error.

The choice of the structured self-completion questionnaire was made based on an extensive review of the literature in the field of ethical consumer decision behaviour. Numerous studies on purchase behaviour in the ethical context can be found, mainly using the Theory of Planned Behaviour, some using the Norm Activation Model, a few applying the Behavioural Reasoning Theory or other approaches, and others combining different theories – for example, the TBP and NAM. A structured self-completion questionnaire was considered to be the best suited instrument for the following reasons: (1) existing research on attitude, personal norms, and behavioural reasoning in the ethical context, which enabled this researcher to develop a broad understanding of the field of research and provided a good foundation for drafting questions; (2) the aim of this research being to develop a generalisable understanding of consumers into the context of CO_2 emission reduction in the food industry, especially the dairy industry; (3) reducing the influence of social desirability; (4) time and cost efficiency in the context of doctoral research; *and* (5) the possibility of a highly structured analysis contributing to academic and management discussions.

The main limitations in the context of this research were related to the possible non-response bias and measurement error (Saunders et al, 2019; Bryman and Bell, 2015). These limitations were minimised through a systematic approach with respect to the questionnaire design, which was informed by prior research and consultation with experts in the field of survey design. Using an online panel reduced the likelihood of non-response bias and helped to keep the survey within time and cost constraints.

6.1.1 Questionnaire

Questionnaires are often used for data collection in quantitative research. A questionnaire is designed to generate information by asking the respondents the same set of questions in a predetermined order (Saunders et al., 2019). For developing the questionnaire design, the researcher followed the steps described by Malhotra and Birks (2017) and adapted these to the research set up.
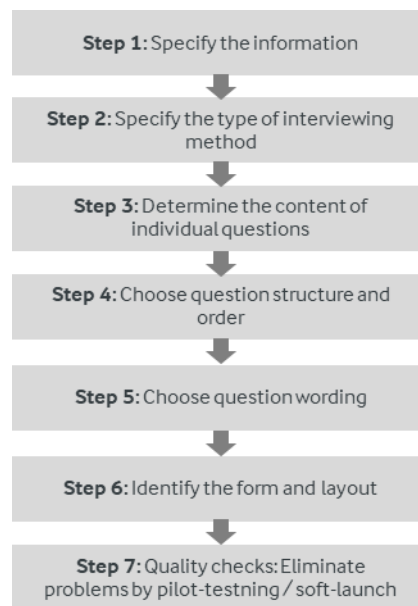
Figure 6.1 Steps applied to develop the questionnaire adapted from Malhotra and Birks (2017)

6.1.2 Specify the information

In the first step, the researcher selected all relevant information available at the time of starting the research project. The information needed was linked to consumer purchase decision making in the context of environmental protection or similar ethical concerns, consumer decision making, and theoretical models used for comparable research questions. The questions for the main constructs were informed by existing research in the field (see Step 3).

6.1.2.1 Specify the type of interviewing method

In the second step, the type of interviewing method is defined. In order to study consumer behavioural intention linked to CO_2 emission reduction, the researcher choose a structured questionnaire with

standardised questions. The aim was to examine and explain relationships between the different variables, in particular cause-effect relationships. Self-completion questionnaires have a number of advantages and disadvantages, which will be summarised. The most important advantage in the context of this study is that the survey method allowed the researcher to obtain information about variables that are not easy to observe, such as attitude and intention, in a systematic way. Another important advantage is that a standardized questionnaire enabled the researcher to analyse the data on a comparable basis. Furthermore, structured questionnaires can be conducted as face-to face interviews, telephone interviews, or self-completion interviews. Using the self-completion option offered the possibility to use different distribution channels, making it possible to conduct a high number of interviews and use a wide geographical focus for the survey. The present research sets out to evaluate the behavioural intention of consumers living in Germany when choosing dairy products produced under the consideration of CO_2 emission reduction. A self-completion structured questionnaire created the possibility of receiving information about population characteristics, which, depending on the sample size, can often be generalised.

To match the requirements for representative data, the self-completion questionnaire executed by an online panel offered a solution, which was manageable considering the limited time and budget for PhD theses. Moreover, self-completion questionnaires are commonly seen as a reliable method to reduce bias and social desirability compared to face-to face or telephone interviews (Dillmann et al., 2014).

However, self-completed online questionnaires also carry certain disadvantages, such as the possibility of measurement error, response bias and challenges associated with data quality. To reduce the possible response bias, the researcher placed significant focus on the development of the construct measurement. Only closed questions were applied, the degree of complexity was reduced as much as possible, and questions with sub-sections were sub-divided into blocks with a maximum of four or five items.

Screening questions were also applied to ensure that only respondents matching the screening criteria participated. This provided assurance that only data of the defined populations were included in the final dataset.

6.1.2.2 Determine the content of the individual questions

The content of each question was carefully selected based on existing studies as discussed in the detailed literature review – all questions were linked with the BRT and NAM theories, and to pro-environmental behaviour (Chapters 4 and 5). In addition, the demographic questions were adapted from research conducted in Germany and were discussed with professional market researchers.

6.1.2.3 Choose question structure and order

The questionnaire was structured according to good practice and discussions with experts.

The questionnaire was divided in two main parts: the screening, quota, introduction and warm-up phase, and the main body of the questionnaire including the demographics, which were already partly used in the quota questions (*see* Table 6.1).

The screening questions ensured that only consumers who were responsible or partly responsible for the purchase of daily food products, were living in households with at least one other person, and were consuming dairy products took part in the study. Respondents fulfilling these preconditions were assumed to be involved in the purchase of dairy products, so engagement and commitment of the respondents to the issue was expected.

Questionnaire structure		
	Topics/constructs	**Question number**
Screening, introduction, warm-up		
	Screening	Q1, Q2
	Quota questions	Q3, Q4, Q5
	Introduction and instructions	Q6
	Warm up questions	Q7, Q8
Main body of questionnaire		
Section 1 BRT	Reasons for	Q9
	Reasons against	Q10
	Attitude - rational	Q11
	Attitude - emotional	Q12
	Social Norms	Q13
	Behavioural Control	Q14
Section 2 NAM	Personal Norm	Q15
	Awareness of consequences	Q16
	Ascription of responsibility	Q17
Section 3	Behavioural purchase intention	Q18
Section 4	Consumer behaviour	Q19
	Pro-evnironmental	Q20, Q21
	Dairy consumption	Q22 - Q25
Section 5	Demographics	Q26 - Q31

Table 6.1 Questionnaire design and structure

Quota questions around gender, age and education were selected. These quota enabled the researcher to assure that the selected sample could be used to provide representative analysis for the German population.

The respondents received an email invitation informing them that the survey is for research purposes only, how long the survey is expected to take, and what incentives are available. The survey invitation did not include specific details about the content of the survey to avoid self-selection bias. The panel members have the possibility to unsubscribe at any time.

The interview was introduced with an introduction and instructions providing brief information about the project and the purpose of the project. The general instructions included information about the requirements around dealing with the questions. Respondents were asked to read the questions carefully and to answer according to their personal opinion and thoughts. Using an online panel made the introduction quite short with the focus on the content and requirements. Information about anonymity, confidentiality, and timing was dealt with in the general panel set up. The warm-up part

included two questions about the respondent's personal consideration of CO_2 emission reduction when purchasing food products.

The main body was organized into five different sections and ordered to enable a natural conversation flow. Questions related to the BRT were presented in the first section. The BRT, in contrast to the NAM, focuses on self-interest based on rational choices. Starting with the reason construct gave the respondents the possibility to evaluate for or against the purchase of dairy products from different perspectives, bearing in mind CO_2 emission reduction. The following questions measured attitude, social norms and behavioural control with topics defined based on prior research. These questions allowed the respondent to evaluate purchase intention in a rational way.

The next section included questions informed by the NAM. Based on this theory, the respondents were given the opportunity to evaluate purchase intention for dairy products produced with CO_2 emission reduction in mind through the lens of altruistic and pro-social motives. This added an additional perspective to the evaluation of purchase intention building, which was informed by the rational and self-interest model of the BRT.

Section three comprised topics measuring behavioural intention – the output variable for this research. The aim was to evaluate which motives have the potential to drive consumers to consider and inform them about CO_2 emission reduction in their purchase decision when buying dairy products that have been produced with CO_2 emission reduction in mind.

In section four, additional information regarding consumer behaviour, pro-environmental behaviour, and dairy consumption was measured. This information provided further input to define different target groups, in relation to the consideration of CO_2 emission reduction when purchasing dairy products, in order to generate a better understanding of behavioural intention. Considering the different pro-environmental behaviours of German consumers gave the researcher the opportunity to understand whether considering CO_2 emission reduction when buying dairy products is similar to other pro-environmental consumer behaviour, which already is established in the German market.

6.1.2.4 Choose question wording

The wording of the questionnaire was aligned with prior research. The questionnaire was developed in English, translated to German, and adapted to the German context. The English version was discussed with experts from Kingston University in London, and the translation into German was

handled by the researcher and discussed with market research experts in Germany. Further optimization of language and wording was applied after the pre-test; this will be discussed in Step 7. Survey was translated into English after all changes have been done.

6.1.2.5 Identify the form and layout

Two "attention" questions were built in to improve the quality of the data and avoid respondents rushing through the questionnaire. All statements were randomized. Reversed questions were only used for two question, one statement for measuring behavioural control and one statement for measuring ascription of responsibility. The reasoning behind avoiding the use of positive and negative statements throughout the questionnaire was as follows:

1. The questionnaire was complex and long. Forcing respondents into further complexity by using two directional statements was considered to have a negative effect on the motivation of the respondent. It would also have increased the time required to complete the questionnaire, possibly exceeding the acceptable limit.

2. Studies using the same models as this research in similar contexts successfully used one directional statements, which let this researcher to believe that good data quality could be achieved by using one directional questions.

Two screening questions were implemented, which required the respondents to be individuals who purchased animal based dairy products and to be responsible/partly responsible for the household grocery shopping. In addition to screening, further questions were implemented to provide assurance that at least one household member consumed animal based dairy products. Two attention topics were also established to improve the quality of and avoid one-line responses. Quotas were used regarding age, gender, and education level to ensure that the questionnaire could provide representative answers for the selected population.

Only closed questions were used. The researcher decided to define the questions based on available studies in the field. They used the pre-test phase to ensure that the defined questions and topics were understandable and that the respondents were able to differentiate their answers. However, some of the topics were quite complex, meaning that it was challenging to motivate the respondent to read the questions properly and differentiate the answers for each of the topics. The researcher established three ways to optimise response quality:

1. Only interviews on which the respondent spent 7 or more minutes were considered for the analysis;
2. the test interviews were used to optimise the wording and structure of the questionnaire; *and*
3. Intense quality checks of the answers (e.g. rejecting one-line responses and responses where there was no clear differentiation between topics)were established.

6.1.2.6 Quality checks and optimization of the questionnaire

The questionnaire was developed in English, translated into German by the researcher, and tested in the German context. The questionnaire was tested in two steps: (1) pre-test of the questionnaire to provide assurance that the questions and answers were understandable and the answers provided could live up to the quality requirement of the researcher; (2) soft-launch with 50 interviews conducted by Qualtrics and checked by the researcher to provide assurance that the questionnaire was understandable and manageable in the proposed time, and that using an online panel could provide satisfying results when dealing with the complex research set up used for this study; *and* (3) further quality checks – attention checks and screening checks.

(1) Pre-test with 10 interviews

10 interviews were conducted with a convenient sample to ensure that all questions were understandable and the developed statements made sense to the respondents. The respondents for the pre-test were selected based on different criteria, such as gender, age, familiarity with the topic, and experience with market research. For these interviews, the researcher spent around 1h on the phone with each respondent. During the pre-test, the respondents had to read the questionnaire aloud and answer the questions in attendance of the researcher. The researcher supervised the respondent closely, was available to answer any clarifying questions and documented the necessary changes to improve the quality of the questionnaire. The questionnaire was adapted after each pre-test interview. Major changes are made to the wording and the questionnaire design through simplification and clarification of the questions and statements. The questionnaire was shortened through the definition of a clearer structure and the reduction of repeated phrases. Some questions and answering categories were also deleted. The aim was to design a questionnaire which could be answered in 15 minutes on average.

The number of changes required reduced after the 6th pre-test interview, which led the researcher to believe that the questionnaire had reached the desired level of clarity and quality. This is why the researcher limited the pre-test to 10 interviews.

(2) Soft launch with 50 interviews and detailed quality checks

After the changes were considered and implemented in the questionnaire, the researcher started a soft launch with the online panel. The soft launch included 50 questionnaires, which were conducted within 2-3 days. After the soft launch, further changes are made to the questionnaire.

Optimisation after the soft launch:

- The age group was set to 18-64 years. The reasoning behind this was that the apparent answer quality of participants aged 65 and older was lower.

- The minimum time for completion was set to 7 minutes and the average of time spent on interviews was 16.4 minutes, just slightly over the planned 15 minutes. The minimum of 7 minutes was evaluated based on answer quality. Participants who completed the interview in less than 7 minutes showed a lower answer quality, measured in terms of one-line responses inconsistencies between responses.

- Multi-item scales with more than 5 items were visually shared in different blocks to keep respondents' attention throughout the survey. This applied for three questions, the questions regarding reasons for and "reasons against" as well as the awareness of consequences.

(3) Further quality checks - attention checks and screening check

Two attention check questions were included in the questionnaire. These were integrated into two of the questions with extended multi-item scales , one in Question 9 and one in Question 16, where the respondent had to give a specific answer. The aim of this was to provide assurance that the respondents were reading the questions and answers properly before responding. The questionnaire was terminated for all respondents who responded to these questions incorrectly. Moreover, Question 24 ensured that only respondents who could confirm that at least one person in their household consumed animal based dairy products answered the questionnaire; otherwise, the interview ended at this stage.

6.2   Measures and measurements

6.2.1   Introduction

Measurement of the variables in the theoretical framework is an important part of the research design (Sekaran and Bougie, 2010). Measurement is the assignment of numbers or symbols to an object in a

way that reflects the quantity of the attribute of the object (Sekaran and Bougie, 2009). Research in consumer behaviour, and behavioural and social science often deal with abstract and subjective attributes which cannot be directly observed. These constructs are latent constructs (Byrne, 2001). Examples for latent constructs are attitude, subjective norms, behavioural control, reasons, personal norms, awareness of consequences, ascription of responsibility, and intention. The latent variables are operationalised by defining the concept for each construct and developing an instrument that can measure the concept (Sekaran and Bougie, 2009). There are two types of latent constructs, reflective and formative variables. Reflective variables mean that the indicators are caused by the underlying latent construct, the direction of the relationship between the construct and the measures is from the construct to the measure. In formative variables, the indicators cause the latent construct, and the relationship runs from the measures to the construct (Saunders et al, 2019; Bryman and Bell, 2015).

6.2.2 Operational definition of research constructs

For the purposes of this research, the latent constructs are operationalised through measures established in the literature, following the body of research which focuses on behavioural intention building in the context of pro-environmental and ethical purchase decisions. More precisely, this research tests the explanatory power of two theories – the Behavioural Reasoning Theory (BRT) (Westaby, 2005) and the Norm Activation Model (NAM) (Schwartz, 1977) – to answer the research question how a dairy manufacturer can improve the consumer contribution to the CO_2 emission reduction goal of the company.

As discussed in Chapter 4, the Behavioural Reasoning Theory builds on the Theory of Planned Behaviour and the Theory of Reasoned Action, which are often applied in different academic research dealing with purchase behaviour considering, for example, environmental issues and organic food purchase (Shin et al., 2018, Onwezen et al., 2013, Perugini and Bagozzi, 2001, Zhou et al., 2013, Tandon et al., 2020, Diddi et al., 2019). The Norm Activation Model is a pro-social theory often used in the context of pro-environmental decision making (i.e. Bamberg et al., 2007; Gräling et al., 2013, van der Werff and Steg, 2015, Han et al., 2015, Zhang et al. 2018, Wang et al., 2019).

The survey framework was developed based on the theory and served as the structure for the questionnaire. The main focus of the questionnaire was to build the relevant constructs for the two theories applied: (1) Behavioural Reasoning Theory with attitude, subjective norms, behavioural control, "reasons for"/"reasons against", behavioural intention; *and* (2) Norm Activation Model with

personal norms, awareness of responsibility, and ascription of responsibility. The body of research in the ethical context dealing with organic food purchase, environmentally friendly behaviour, and the literature on the two theoretical models as been used to define the questions for this research.

The two models - BRT and NAM - only use latent constructs. Therefore, this research only includes latent constructs. As a dependent variable, behavioural intention as defined in the BRT and the TBP/TRA approach has been applied. The independent variables are "reasons for" and "reasons against", attitude, subjective norms, behavioural control, personal norms, awareness of consequences, and ascription of responsibility as defined in the NAM.

This chapter provides a discussion of the constructs applied, the operationalisation of the different measures for this research (section 6.3.1 and 6.3.2), as well as the procedures adopted to develop and design the research instrument (section 6.3.3).

6.2.3 Dependent variable

The BRT uses behavioural intention as a dependent variable. The construct is operationalised based on Ajzen's (1991) research and is determined by attitude, subjective norms, and behavioural control.

The construct is measured by using three different items – "plan to buy…", "intent to buy…", "increase the effort to buy …" – which have frequently been successfully tested in different research approaches (*i.e.* Diddi et al., 2019; Ryan and Casidy, 2018; Claudy et al., 2015; Claudy et al., 2013). The respondents are asked whether they plan, intend, or will extend their effort to buy dairy products from companies committed to CO_2 emission reduction. The intention dimensions are measured on a 5-point Likert scale: (1) strongly agree; (2) somewhat agree; (3) neither agree or disagree; (4) somewhat disagree; *or* (5) completely disagree (*see* Table 6.2).

Construct Behavioural intention	Question	Items	Source
Intention		*To which extent do you agree/disagree to the following statements to buy dairy products produced under the consideration of CO_2 emission reduction? Please evaluate the statements on a scale from 1-5 considering the following meaning: (1) strongly agree, (2) somewhat agree, (3) neither agree or disagree, (4) somewhat disagree, (5) completely disagree. It does not matter whether you currently know companies that claim to reduce CO2 emissions.*	Ajzen, 1991; Perugini and Bagozzi, 2001, Zhou et al, 2013
	Q15_1	*I am planning to buy dairy products from a company committed to CO2 emission reduction.*	
	Q15_2	*I intent to buy dairy products form companies committed to CO2 emission reduction.*	
	Q15_3	*I will extent the effort on choosing dairy products from companies committed to CO2 emission reduction.*	

Table 6.2 Operationalisation of the intention construct

6.2.4 Independent variable

Reasons for/against, attitude, perceived behavioural control, and subjective norms have been utilised and operationalised as independent latent variables based on the BRT. The different "reasons for" and "reasons against" have been informed by prior research like Claudy et al. (2015), Westaby et al. (2010), Hughner et al. (2007) (*see* Table 6.3).

Attitude is considered to represent a summary evaluation of a psychological object captured in attribute dimensions as good-bad, harmful-beneficial, pleasant-unpleasant, and likable-dislikable (Ajzen and Fishbein, 2000; Eagly and Chaiken, 1993; Petty et al., 1997). The attitude construct was surveyed through the use of semantic differentials on cognitive and affective adjectives based on prior research. Examples are Perugini and Bagozzi (2001), Zhou et al. (2013), and Shin et al. (2018). The five cognitive attitude items are on the semantic differential "For me, buying dairy products from a company committed to CO_2 emission reduction is…" beneficial – harmful, wise – foolish, attractive – unattractive, valuable – worthless and advantageous – disadvantageous. The affective items describing the feeling when buying these dairy products are good – bad, pleased – displeased. The German translation of the items has been changed slightly to adapt it to the German context. The tendency to engage in evaluative responses has been researched by Javis and Petty (1996). They found that respondents with high scores are more likely to hold attitudes toward various social and political issues, and to list more evaluative thoughts about unfamiliar paintings and about a typical day in their lives. By measuring attitude based on a semantic differential, this researcher expects higher participant involvement and a greater degree of differentiation between answers; therefore, increasing the likelihood of the researcher to improve understanding around the participant's attitude.

Constructs BRT	Question	Items	Source
Attitude		*How would you describe your attitude towards companies producing dairy production under the consideration of CO2 emission reduction? For me, buying dairy products from a company that is committed to CO_2 emission reduction when producing dairy products is ...*	Zhou et al. (2013); Perugini and Bagozzi (2001); Shin et al. (2018)
	Q11	beneficial - harmful wise - foolish attractive - unattractive valuable - worthless advantageous - disadvantageous	
		Buying dairy products from a company that is committed to reducing CO_2 emissions makes me feel like this ...	
	Q12	good - bad satisfied - dissatisfied	
Subjective Norms		*To what extent do you agree or disagree with the following statements? In your answer, please take into account the people whose opinion you value. Please read the statements carefully and use the answer option from the five suggested options that best suits you. Evaluate on a scale from (1) strongly agree, (2) somewhat agree, (3) neither agree or disagree, (4) somewhat disagree, (5) completely disagree.* *Most of the people whose opinion I value very much ...*	Ajzen (1991); Perugini and Bagozzi (2001); Zhou et al. (2013); Shin et al. (2018)
	Q13_1	... believe that I should buy dairy products from companies that claim to reduce CO_2 emission.	
	Q13_2	... would recommend buying dairy products from companies that claim to reduce CO_2 emission.	
	Q13_3	... think it's important that I buy dairy products from companies that claim to reduce CO_2 emission.	
	Q13_4	... would themselves buy dairy products from companies that claim to reduce CO_2 emission.	
	Q13_5	Because of my social environment, I feel obliged to buy dairy products from companies that claim to reduce CO_2 emission.	
Behavioural Control		*The following statements relate to your personal influence on the decision for sustainable dairy products. To what extent do you agree or disagree with the following statements? Evaluate on a scale from (1) strongly agree, (2) somewhat agree, (3) neither agree or disagree, (4) somewhat disagree, (5) completely disagree.* *Buying dairy products from companies that have committed to reducing CO_2 emission ...*	Zhou et al. (2013); Onwezen (2013); Kraft (2005); Perugini and Bagozzi (2001)
	Q14_1	… would be easy for me if I wanted to.	
	Q14_2	… would be possible for me if I wanted to.	
	Q14_3	… it's my own decision.	
	Q14_4	... is generally not possible for me.	

Table 6.3 Operationalisation of the constructs of the Behavioural Reasoning Theory

Subjective norms are described by how the participant believes that people important to them would like them to act and are measured according to five statements based on Ajzen's (1991) Theory of Planned Behaviour, and research conducted by Perugini and Bagozzi (2001), Zhou et al., (2013), and Shin et al. (2018). Behavioural control describes the participants' perception regarding their own control with regard to acting on CO_2 emission reduction considerations when purchasing dairy products. The variables are defined based on research by Kraft (2005), Zhou et al. (2013), Onwezen (2013), Perugini and Bagozzi (2001). "Reasons for" and "reasons against" were considered in detail in the questionnaire. Based on Westaby (2005), the reasons influence intentions and behaviour, provide contextual information, provide a better understanding of the cognitive routes to understanding the participants' behaviour and decision making process, and can improve the prediction of intention and behaviour.

Within this research, eleven "reasons for" and eighteen "reasons against" were identified to be included in the questionnaire (*see* Table 6.4). These reasons were based on recent research on the Behavioural Reasoning Theory in a similar context; for example, Diddi et al. (2019), Tandon et al. (2020), Ryan and Casidy (2018), Peterson and Simkins (2019). Dhir et al. (2021), Claudy et al. (2015).

The reasons defined for these studies where listed and adapted to the context of this research. Diddi et al. (2019) used as reasons for: perceived value, sustainability commitment, uniqueness, acquisition from known sources, lifestyle changes and as reasons against perceived lack of variety/style, budget constraints, scepticism, lack of knowledge/skills, emotions, perceived lack of availability and self-indulgent behaviour. Dhir et al. (2021) used based on prior research the reasons described as personal benefits, environmental benefits, risk barrier, value barrier, image barrier and usage barrier and all measurement items showing strong factor loading. The chosen reasons in the different research approaches vary due to the context of the different studies. The researcher mainly focused on the structure of the reasons – benefits and barriers - like environmental benefits, trust, scepticism etc. and defined the relevant statements.

During the questionnaire pre-test, the reasons were evaluated differently, which led to the decision to keep an extended set in the questionnaire and analyse the data to select the relevant "reasons for" and "reasons against". The researcher limited the number of items per construct to 5, where possible. The reason constructs were defined based on content and a principal factor analysis.

The "reasons for" and "reasons against" were grouped according the content (*see* Table 6.3). With two constructs as reasons for – "Environmental Benefits" and "Trust" – and four constructs as "reasons against" – "scepticism", "image of dairy", "purchase decision dairy", and "other decision criteria". Only "image of dairy" was measured using two indicators; the other constructs had 3 to 5 indicators. A principal factor analysis was conducted to confirm the chosen categories. All reason constructs aside from "image of dairy" showed a high eigenvalue. The "image of dairy" construct could only be accepted if the measurement model results were acceptable.

Constructs Reasons for/against	Question	Items	Source
Reason for	*If there were companies that consider CO2 emissions reduction in the production process of dairy products, what are the reasons for buying these dairy products? Please only select "applies completely", "applies" if it is a real reason for you. Please differentiate between "applies completely" and "rather applies". If it is not a reason, please select "does not apply".* *I buy dairy products from companies that reduce CO2 emissions because ...*		Westaby (2005), Claudy et al. (2013), Claudy et al (2015), Diddi et al. (2019), Tandon et al. (2020), Sahu et al. (2020) and own adaptions in context with the objective
	No category — Q9_1	...my personal purchase has an effect on the climate protection.	
	Environmental benefits — Q9_2	... because each purchase of groceries supports to reduce the CO_2 emission.	
	Q9_3	the reduction of the CO_2 emission of the dairy industry is good for the next generations.	
	Q9_4	... the CO_2 emission reduction of the dairy industry improves my personal living space.	
	Q9_11	.. if all consumers decide for dairy products produced under consideration of CO_2 emission reduction, more and more companies will reduce the CO_2 emission in the production process and therewith do something good for the environment.	
	Trust — Q9_5	... I generally buy organic and local products and assume that these are produced under consideration of the CO_2 emission.	
	Q9_6	... I trust the brands I buy to reduce the carbon footprint in production.	
	Q9_7	...the goods are labeled with an environmental seal that indicates CO_2 emissions reduction.	
	Q9_8	... I buy well-known brands, because I believe that they more likely have the opportunity and the obligation to invest in reducing CO_2 emissions.	
	Q9_9	... I generally take time to choose sustainably produced food products.	
	Q9_10	... I purchase expensive dairy products, then I am sure that the CO_2 emission will be considered.	
Reasons against	*If there were companies that pay attention to the reduction of CO_2 emissions in the production process of dairy products, what reasons would hold you back buying these dairy products? Please only select "applies completely", "applies" if there is a real reason for you. Please differentiate between "applies completely" and "rather applies". If it is no reason for you, please select "does not apply".* *I would <u>not</u> buy dairy products from companies that reduce CO_2 emissions in production because ...*		
	Scepticism — Q10_1	... my personal purchase of dairy products has no effect on the reduction of CO_2 emissions.	
	Q10_2	... I do not know dairy companies that claim to reduce the CO_2 emissions.	
	Q10_3	... I don't think there is a dairy comapny that has changed the production method to reduce CO_2 emissions.	
	Q10_4	... I do not trust the information given by companies on reducing CO_2 emissions.	
	Q10_5	... it is hard for me to believe that there is a dairy company that has control over the products from the animals on the farm to the products in the supermarket.	
	Q10_7	... because I don't have the necessary information to understand the importance of CO_2 emissions in the dairy industry	
	Q10_8	... because it is difficult to find dairy products that have been manufactured considering the CO_2 emission reduction.	
	Q10_18	... because I always have to do my own research into CO_2 emissions before I trust the communication of the company.	
	Image dairy — Q10_6	... I miss a seal on dairy products that, for example, indicates "climate-friendly production" or contains official information on "CO_2 emissions per 1 kg of goods".	
	Q10_14	... plant-based dairy alternatives are better for the CO_2 balance.	
	Purchase criteria — Q10_9	... taking into account the CO_2 emissions when buying dairy products would mean too much effort for me.	
	Q10_10	... I don't spend a lot of time shopping for dairy products.	
	Q10_13	... when buying dairy products price is of highest importance.	
	Q10_15	... I always buy dairy products based on the same criteria, regardless of the company's commitment to the environment.	
	Other decision criteria — Q10_12	... the most important purchase criterium to buy dairy products is that they are healthy.	
	Q10_11	...because I generally do not consider dairy products as particularly environmentally friendly.	
	Q10_16	... for me animal wellfare is more important than the CO_2 emissions of the dairy companies.	
	Q10_17	... for me, ecological production is more important than taking CO_2 emissions reduction into account.	

Table 6.4 Operationalisation of "reasons for" and "reasons against"

The questions for the NAM were mainly based on research on ethical consumer behaviour, such as that conducted by Bamberg and Schmidt (2003), Gärling et al. (2003), De Groot et al. (2007), Onwezen et al., (2013), and Shin et al. (2018). In the named research environment is considered to

be an ethical question. As mentioned in the literature review, the environment can be defined as an abstract entity in need. The effect of CO_2 emission reduction has positive consequences for others – i.e. future generations and nature – and mitigates the harmful impact of CO_2 emissions on the environment.

Personal norms were measured according to four items (Onwezen et al. 2013; Bamberg et al., 2007; Bamberg and Schmidt, 2003; Gärling et al., 2003) – the participants' moral obligation, the strong obligation to act, the feeling of importance that something is done, and the obligation independent of what others are doing. The awareness of responsibility was measured based on 9 items evaluating CO_2 emission reduction in different context (Shin et al., 2018; Bamberg et al., 2007; Onwezen et al., 2013). Ascription of responsibility was measured using five items, based on research conducted by Bamberg and Schmidt (2003) Shin et al. (2018), Onwezen et al. (2013), De Groot et al. (2007), describing how important it is for participants to take responsibility and act on it. All measurements are shown in Table 6.5.

Constructs NAM	Question	Items	Source
Personal Norm		*Please evaluate the following statements concerning your personal attitude towards the purchase of dairy products produced under the commitment of CO_2 emission reduction. It does not matter whether you currently know dairy companies that claim to reduce CO_2 emission. Evaluate on a scale from (1) strongly agree, (2) somewhat agree, (3) neither agree or disagree, (4) somewhat disagree, (5) completely disagree.*	Onwezen et al. (2013), Bamberg et al. (2007), Bamberg and Schmidt (2003), Gärling et al. (2003)
	Q15_1	When purchasing dairy goods, I feel morally obligated to consider the company's commitment to reduce CO_2 emissions.	
	Q15_2	I believe that while purchasing dairy products, I should consider the company's commitment to minimise CO_2 emissions.	
	Q15_3	I believe it is critical that the general public pay attention to companies' commitments to minimise CO_2 emissions.	
	Q15_4	Regardless of what others do, I feel obligated to consider the company's commitment to minimise CO_2 emissions while purchasing dairy products because of my own values/principles.	
Awareness of conseqeunces		*Please indicate to what extent you agree with the following statements on the effects of CO_2 emissions. Please read the statements very carefully and tick the answer option from the five options that in your opinion best fits each individual statement. Evaluate on a scale from (1) strongly agree, (2) somewhat agree, (3) neither agree or disagree, (4) somewhat disagree, (5) completely disagree.*	Shin et al. (2018), Bamberg et al. (2007), Onwezen et al. (2013)
	Q16_1	The CO_2 emissions of the food industry have negative effects on climate change (e.g. rising temperatures, extreme weather events).	
	Q16_2	The CO_2 emissions from dairy companies have a negative impact on climate change.	
	Q16_3	The CO_2 emissions of dairy companies can have a major impact on climate change.	
	Q16_4	Dairy companies are responsible for a large proportion of the CO_2 emissions of the food industry.	
	Q16_5	The CO_2 emissions of the dairy industry have a negative impact on the quality of life for future generations.	
	Q16_6	There is an urgent need for action with regard to the CO_2 emissions of the dairy industry.	
	Q16_7	An environmentally conscious dairy company reduces the CO_2 emission in order to minimize climate change.	
	Q16_8	Cows are responsible for the majority of the emission of climate-damaging gases from the dairy industry.	
	Q16_9	Dairy companies are responsible for negative environmental impacts due to their CO_2 emission - locally and regionally.	
Ascription of responsibility		*Please indicate to what extent you agree with the following statements on responsibility for reducing CO_2 emissions. Please read the statements very carefully and tick the answer option from the five options that in your opinion best fits each individual statement. Evaluate on a scale from (1) strongly agree, (2) somewhat agree, (3) neither agree or disagree, (4) somewhat disagree, (5) completely disagree.*	Bamberg and Schmidt (2003), Shin et al. (2018), Onwezen et al. (2013), De Groot et al. (2007)
	Q17_1	I believe that every consumer of dairy products is partly responsible for the CO_2 emissions caused by the dairy industry.	
	Q17_2	I believe that all dairy consumers are jointly responsible for the CO_2 emissions caused by the dairy industry.	
	Q17_3	Every single consumer of dairy products must take responsibility for the CO_2 emissions caused by the dairy industry.	
	Q17_4	The CO2 emission of the dairy company is very important to me when buying dairy products.	
	Q17_5	For me, it is not important how dairy companies are dealing with CO_2 emission and the associated impact on the climate.	

Table 6.5 Operationalisation of the Norm Activation Model

In order to define the questions, available and relevant questionnaires were critically reviewed and, where possible, research questions validated in similar research context were utilized. This was evaluated as the most suitable approach to design a questionnaire based on established theory, and available research and learnings.

In addition, a set of questions regarding the purchase behaviour of dairy products, the attitude towards environmental protection, as well as demographic questions, were developed for the questionnaire. These questions informed further analysis especially in regard to supporting managers to develop

new communication strategies for the German market. Pro-environmental behaviour, consumption behaviour of dairy products, and demographics were considered in detail.

Pro-environmental behaviour was evaluated through 21 items describing the consumer's information status and consideration of already established pro-environmental behaviour in Germany, i.e. recycling, waste management, energy saving, and car sharing. The items were discussed with an expert of German market research. The aim was to generate a clear picture regarding the consideration of CO_2 emission reduction in the production process of dairy products compared to the already established pro-environmental behaviour of consumers in the German market.

The questionnaire responses will be used to analyse different consumer profiles, the personal consideration of pro-environmental behaviour in the context of culturally established pro-environmental behaviour in Germany (recycling, energy saving, etc.), and intention building around purchasing dairy products produced under the consideration of CO_2 emission reduction.

Dairy consumption and purchase was divided into milk, spoonable and drinkable formats, such as yoghurt, quark, and cheese. For these options, different consumption and purchase frequencies – daily, weekly, several times a month - were considered.

Household size was determined by defining different household categories used in Germany questionnaires (i.e. single household, married without kids, married with kids, single parent living with kids, shared apartment, live together with parents, living together with different generations). The household categories frequently showed an effect on the purchase behaviour of dairy products, which will be examined in the following analysis. In addition to these questions, the main demographic questions used for surveys in the German market were implemented into the questionnaire. These included age, gender, city and/or size of the city, and income. This information was used for further analysis regarding consumers behavioural intention with regard to different customer segments, and to define a more targeted communication approach regarding CO_2 emission reduction in the production process of dairy products.

The questionnaire can be found in Appendices A.9 (German version) and A.10 (English version).

6.2.5 Scaling

Types of measurement used in marketing research include nominal, ordinal, interval, and ratio scales (Malhotra and Birks, 2017). For the purposes of the current research, nominal, ordinal and interval

scales were used. Nominal scales were used for demographics, such as gender, as well as well as for questions around consumption of animal based dairy products. Ordinal scales were used for different questions around consumption and pro-environmental behaviour. Interval scales were applied for demographic information, such as age, income, and also for the different constructs.

The main constructs – "reasons for"/"reasons against", attitude, social norms, behavioural control, behavioural intention, personal norms, awareness of consequences, and ascription of responsibility – were measured using different items/statements and a non-comparative scaling technique. This meant that respondents evaluated one statement at a time and did not have to compare the statements when answering the questionnaire.

Attitude was measured using semantic differential scales to describe the set of beliefs that described the person's perception or behaviour (Ajzen, 1991; Aaker et al., 2007). The respondents were asked to rate their attitude towards companies committed to CO_2 emission reduction when purchasing dairy products on a bipolar scale described by pairs of opposite adjectives (Saunders, 2019). Each item was assigned a rating with 5 points where respondents decided whether to evaluate the items positively or negatively. The bipolar scale covered five different cognitive differentials – beneficial-harmful, wise-foolish, attractive-unattractive, valuable- worthless, advantageous- disadvantageous, and the two affective differentials of good- bad and pleased- displeased. These measures have been used in some studies in the pro-environmental context. For example, Zhou et al. (2013) used semantic differentials for research regarding the purchase of organic vegetables. Semantic differentials were evaluated as the most reliable way to get information on people's emotional attitude towards the topic of interest.

Furthermore, the researcher used a five-point Likert scale for all-but-one items and a three-point Likert scale for asking the respondents about the degree of agreement to the different statements for reasons for/against. The Likert scales were adapted from German school scoring, with 1 representing the best result and 6 the worst result; this is standard practice for market research in Germany. The researcher increased simplicity by clearly positioning positive evaluation on the left and negative evaluation on the right hand-side.

For the purposes of this research, the 5-point Likert scale used for all-but-one constructs was defined in the following way: 1=strongly agree; 2= somewhat agree; 3=neither agree/nor disagree; 4= somewhat disagree; 5=strongly disagree. This was used for the majority of statements in accordance with established theories and existing research.

The "reasons for" and "reasons against" constructs were measured using a 3-point Likert scale: 1=completely applies; 2=somewhat applies; 3= does not apply/not a reason, adapted from Westaby (2005). For the reasons for/against it was important to find out whether they were important for the participant or not. That is why the 3-point Likert scale was considered to be more useful for these kinds of questions.

In general, the Likert scale is easy to understand and people participating in online panels are used to Likert scales. The disadvantage is that the respondents have to read and reflect on each statement and questions using the Likert scale often take longer to complete than those using other itemised rating scales (Malhotra and Birks, 2017). However, for the purposes of this research, the need to reflect on each statement was considered to be an advantage as the researcher's aim was to obtain a clear and reflected answer from the respondent for each for all of the constructs. Furthermore, Likert scales are successfully used in research and online panellists are quite familiar with these kinds of scales, so applying these was assumed to not require too much additional time for the respondents.

6.2.6 Common method bias

When data for both independent and dependent variables are collected from the same person in the same measurement context utilising the same item context and similar item attributes, common method bias might occur. Method biases are the most common form of measurement mistake, and they can jeopardise the validity of any conclusions drawn regarding the correlations between variables (Podsakoff et al., 2003). In this setting, systematic measurement error is critical because it gives an alternate explanation for the observed link between different constructs that is unrelated to the hypothesised association (Bagozzi and Yi, 1991) and can lead to incorrect conclusions.

Schaller et al. (2015) examined the various statistical approaches employed in published TBP research. Their findings suggest that the published results they looked at are resistant to common method variance bias because the correlation between substantive variables and percentage reduction due to common method variance is consistently significant. When compared to the correlations from which they are formed, the structural path coefficients in the TBP appear to be even more robust to the effect of common method variance.

6.3   Data cleaning

Intense quality checks of the database were conducted to prepare the data for analysis. These checks included:

- Attention checks
- Straight liners
- Missing data
- Quota alignment

Attention checks

Different attention checks were implemented into the questionnaire. Two items were integrated into long item lists, one in Question 9 and one in Question 16, where the respondent had to give a specific answer to provide assurance that they had read the questions and answers carefully before answering. The questionnaire was terminated for all respondents who answered these questions incorrectly.

Moreover, question 24 confirmed that the screened respondents had at least one member of their household who consumed animal based dairy products. The questionnaire was terminated for all respondents for whom this could not be confirmed.

Straight-Liners

The researcher put considerable effort into reducing the number of one-line responses when receiving the data. Firstly, the online panel provided a "scrubbing service" to assure that the most obvious low-quality answers were eliminated from the outset. This is the stage at which one-line responses, as well as information which did not make any sense, were deleted. When the researcher received the data, additional quality checks were conducted. The researcher defined straight-liners as respondents who answered at least 5 out of the 9 main questions for the model (Questions 9, 10, 11, 13, 14, 15, 16, 17, 21) with one-line responses. This check was implemented each time the data came back from the online panel and around 40 respondents were deleted using this method.

Missing data

All interviews with missing data were checked and most of them were deleted. For example, in the beginning there was a mistake where respondents were given the option to continue with the interview even though they did not choose one of the two options available. Screening Question 2 asked the respondent about their responsibility/partial responsibility for household grocery shopping. All cases

were deleted except three where the respondents lived on their own. The three cases with respondents living in a single household were decoded manually. The transfer to the database did not work for one interview, but the respondent had filled in the screening question correctly and so the interview was de-coded manually. One additional participant missed out on screening Question 1 and the interview was not terminated. However, this person answered in Question 24 that the household only consumed animal based dairy products, which meant that the researcher de-coded these answers as well. There was no further missing data found in the data set.

Alignment – Time and Quota

After the soft launch – the first 50 interviews - the time frame and quota were adapted.

a. The time was set to at least 7 minutes for the whole questionnaire, which meant that the average time taken to answer the questions was around 16 minutes. There were clear data quality issues with the interviews where the respondents had taken less than 7 minutes to complete the questionnaire.

b. The age of the respondents was set to a maximum of 64 years. Based on a detailed analysis of the older respondents (>64 years old) it became clear that the data quality for these respondents was lower than for the other interviews – mainly lower differentiation between the answers and more one-line responses than in the other age groups. Therefore, these interviews were not considered in the further recruiting and analysis.

Corrections after survey launch

After the optimisation following the soft launch, the survey was restarted. The researcher followed the conduction of the interviews closely. The next data quality check was conducted when the quotas were reached.

1. **Missing qualification for participation:** there was a mistake at the screening questions stage, which made it possible for respondents to answer all questions, even though they did not qualify for the interview. This was not accepted by the researcher and these cases were deleted from the data set.

2. **Too little variance in the answers:** The researcher defined the questions for the constructs derived from the two theories – "reasons for", "reasons against", attitude, personal norms, behavioural control, awareness of responsibility, and ascription of responsibility – as questions of

high importance. Question 21, which dealt with environmentally friendly behaviour, was considered to be of the highest importance. If more than half of the questions were answered in a straight lines, the questionnaire was deleted from the data set; the aim of the researcher was to increase the quality of the data. Only 20 datasets – around 3% of the interviews - were deleted based on this quality check, which clearly showed that a differentiation in the answers was generally made by the participants and confirmed that straight-line responses indicated interviews of lower quality that could be deleted.

Following the quality checks under 1. and 2., the data sets were deleted, and the survey was restarted with a clear goal to fulfil the quotas. A hard exit for the second screening question was established. After this round, new data checks were conducted with a focus on inconsistency and one-line responses. New straight-line responses were observed, deleted, and the survey was restarted again.

The fieldwork was stopped when the necessary quotas were fulfilled and the data quality was considered acceptable. The output was 791 interviews of acceptable quality.

6.4   Conclusion

In this chapter, the development of the questionnaire, the measurements and measures were discussed in detail. The questionnaire was developed based on a strong theoretical foundation and research in pro-environmental consumer decision making in order to answer the research question around consumer' intention to buy dairy products produced by companies which are committed to CO_2 emission reduction. The researcher used a survey with a self-completion questionnaire conducted via an online panel. This approach was evaluated as the best suited approach to answer the research question and keep to the time and budget constraints of a PhD thesis. The final version of the questionnaire was based on a literature review, expert discussion, translation and adaption to the German market, and a detailed pre-test and soft launch to assure the reliability and validity of the instrument. It resulted in a dataset of 791 valid interviews, which could be used for data analysis, thereby fulfilling the quotas and quality requirements of the researcher are available. In the next chapter, a detailed analysis of the data will be presented and discussed.

Chapter 7: Data Analysis

7.1   Introduction

In social science multivariate methods have been applied widely. There are two different generations of multivariate methods simultaneously analysing multiple variables. The first-generation techniques include regression-based approaches, factor analysis, cluster analysis, variance analysis, and multidimensional scaling. These are used to confirm existing theories (confirmatory) by testing hypotheses, or to search for patterns in the data (exploratory) if no or only limited knowledge on the relationship of variables is available. The second-generation techniques refer to the structural equation modelling (SEM), which enables the researcher to incorporate unobservable variables measured indirectly by indicator variables (Hair et al., 2017). This is often used in social sciences and accounts for measurement error (Chin, 1998). By applying SEM the researcher can test theories and concepts by assessing the latent variables at the observation level – the measurement model – and test the relationship between latent variables on the theoretical level – the structural model (Bollen, 1989).

Chapter 7 of this thesis introduces the different SEM types, explains the choice of PLS-SEM, and documents the analysis of the data collected. After a short introduction to SEM methods (7.2) and the discussion of the decision for the selected approach (7.3), the PLS-SEM model is assessed in two steps: (1) the measurement model (7.4.1); *and* (2) the structural model (7.4.2). These steps are important to assure, that the PLS-SEM can be used for the defined research approach and is appropriate for the collected data. In 7.4.3, the model is also assessed for mediation and moderation effects of gender and educational level. The main results are summarised in the conclusion.

7.2   Structural Equation Model

Structural Equation Model (SEM) is widely used in social sciences. The purpose of SEM is for theory testing (Rigdon, 1998) and developing explanatory structural models (Kline, 2011). The model combines different analytical techniques in one model (Keith, 2006), i.e. regression, examination of latent variables and observed variables, and combining path and factor analytical techniques. Due to the wide use and high interest in applying SEM, different software packages are available to support its application (Chin, 1998).

A major strength of SEM is that it can test for relationships between complex and multifaceted constructs employing latent variables, which are inferred from measurable items. Another important point is that by using SEM, one can model relationships between multiple predictors and criterion variables. Typical research questions that can be answered by using the SEM techniques include those associated with the analysis of complex systems of relationships, causal systems, or indirect (mediated) effects.

The following section will focus on the choice of the type of Structural Equation Models – Covarianced-Based – SEM (CB-SEM) versus Partial Least Squares – SEM (PLS-SEM) for this research.

7.3   Choice of method

The research focuses on predicting behavioural intention to buy dairy products, which are produced under the consideration of CO_2 emission reduction. By applying the BRT and the NAM with the constructs reasons for/against, attitude, social norms, perceived behavioural control, personal norms, awareness of consequences, and ascription of responsibility, only latent variables inferred by other observables and measurable variables are used.

In addition to the possibility to predict the behavioural intention in this model, SEM allows for the definition of relationships among predictors and criterion variables. This means that it is possible to understand the causal explanation between the different variables to confirm or deny the hypotheses developed based on the theory.

There are two types of SEM, CB-SEM and PLS-SEM. The CB-SEM focuses on the overall fit of a model to the data; whereas the PLS-SEM is more prediction oriented, focusing on how well the endogenous variable is explained (Hair et al., 2017). The PLS-SEM estimates latent variable scores as exact linear combinations of their associated manifest variables (Fornell and Bookstein, 1982) and treats them as exact linear combinations of their manifest variables. The scores capture the variance that is useful to explain the endogenous latent variable. An advantage of using a series of OLS regressions is that there is no need for normal distribution

of the data. It can also be used for smaller sample sizes, while still achieving high levels of statistical power. (Reinartz et al., 2009). A comparison is provided in Table 7.1.

	CB-SEM "hard modelling"	PLS-SEM "soft modelling"
Definition	CB-SEM develops a theoretical covariance matrix on a set of structural equations with the goal to estimation the model parameters so that the difference between the theoretical covariance and estimated covariance is minimised	PLS-SEM is a causal model approach with the aim to maximise the explained variance of the dependent latent constructs
Research objective	Estimation and description **Theory testing, theory confirmation comparison of alternative theories**	**Prediction** and identifying key driver constructs
Requirements	Based on strong theory High informational and distributional requirements (i.e. normal contribution) Only interval scales Minimum of 200 to avoid non- convergent and improper solutions Only reflective variables Mind. 3 – 4 Indicators per latent variable (identification issue) One weak construct influences all parameter estimates and latent variable estimates	No requirement regarding distribution or measurement scale of indicators From 20 or rule o thumb (10 times the max. number of paths aiming at any construct in the outer model and inner model) Formative and reflective latent variables No requirements regarding number of indicators per construct More robust towards inappropriately operationalised constructs
Model preferred, when …	Focus theory testing or confirmation Overall-fit measurement is needed Focus on the structural relationship between the latent constructs The model has circular relationships	Focus on prediction Formative constructs Complex structural model Small sample size Use of latent variable scores in subsequent analysis

Table 7.1 Comparison CB-SEM and PLS-SEM (Reinartz et al., 2009; Hair et al., 2017)

Based on Table 7.1, one can evaluate which form of structural equation model is the preferred approach to answer the research question.

The objective of this research is the prediction of the behavioural intention of consumers to buy dairy products from companies that are committed to CO_2 emission reduction. In the following section, the choice of SEM will be discussed in more detail. With the application of the PLS-SEM the strong theoretical background, in this case the BRT and NAM, is re-conceptualised to improve the prediction of consumer purchase intention. By contrast, the CB-SEM is mainly used to confirm established theories, which is not part of the research goal.

The PLS-SEM is able to facilitate SEM solutions with different levels of complexity in the structural model and/or constructs - including higher order constructs that typically reduce multicollinearity problems (Hair et al., 2018), unobserved heterogeneity (Hair et al., 2016; Matthews et al., 2016), multi-group analysis (Matthews, 2017), and different algorithms (Sarstedt et al., 2016). This research has a relatively high complexity in the structural model and constructs, which can be handled by PLS-SEM.

Furthermore, only reflective indicators and the usage of interval scales in the form of Likert scales are used, which makes it feasible to apply both SEM approaches.

Disadvantages of applying the PLS-SEM include the missing measure for overall fit of the model, the usage of prediction-oriented, non-parametric evaluation criteria, the usage of re-sampling procedures (Hair et al., 2011), as well as the PLS-SEM-bias in complex models. The overall-fit measurement is mainly important in the context of theory testing and is, therefore, not in focus for the purposes of this research. The concerns regarding non-parametrical evaluation are associated with the usage of re-sampling procedures that are part of the PLS-SEM (i.e. bootstrapping). The researcher evaluates the advantage of applying the PLS-SEM in the context of the research question in order to receive a robust model as higher than the risk associated with non-parametrical evaluations and re-sampling procedures. The estimated latent variable scores involve some degree of error, which is reflected in the path coefficients and produces a bias (Hair et al., 2016). PLS-SEM tends to underestimate the parameters of the structural model and overestimates the measurement model compared to CB-SEM (Dijkstra, 1983), but it is expected to be robust even if weak constructs are considered (Reinartz et al., 2009). The underestimation of the structural model relationships and overestimation of the measurement relationships is referred to as the PLS-SEM bias. Simulation studies have shown that the difference between PLS-SEM and CB-SEM is usually very small and does not play a role in most empirical settings (Henseler et al.,2014; Reinartz et al., 2009; Ringle et al, 2012). This study is empirical and, therefore, the PLS-SEM bias is not a limitation in applying the PLS-SEM.

Based on the research objective, the complexity of the structural model, and the other points discussed above, the PLS-SEM seems to be the most appropriate choice. Using PLS-SEM the researcher expects to develop a high predictive accuracy, while at the same time being grounded

in well-developed causal explanations (Sarstedt et al., 2018). Gregor (2006, p. 626) states that the PLS-SEM "implies both [an] understanding of underlying causes and prediction, as well as [a] description of theoretical constructs and the relationships among them". Combining the two perspectives aligns well with different types of business research, which often aim to test a theory (i.e. explanation), while developing recommendations for management practice (i.e. prediction) (Jöreskog and Wold, 1982, p.270). Table 7.2 presents a summary of the main decision criteria for the PLS-SEM.

Rule of thumb	Suggested SEM-method	Applies to this research?
If the goal is predicting key target constructs or identifying key "driver" constructs	PLS-SEM	yes
If the research is exploratory or an extension of an existing structural theory	PLS-SEM	yes
If the structural model is complex (many constructs and many indicators)	PLS-SEM	yes 13 constructs x indicators
If the data are to some extent non-normal	PLS-SEM	not tested
If the sample size is relatively low, but meets the minimum sample criteria	PLS-SEM	sample size is with N=791 relatively high

Table 7.2 Summary of the main decision criteria for PLS-SEM

7.4   Data analysis

The goal of the PLS-SEM is to maximise the explained variance of the endogenous latent variables in the PLS path model (Hair et al., 2017). To be able to reach this goal, the quality of the PLS-SEM measurements and structural model focusing on the predictive capabilities of the model must be evaluated. The assessment of PLS-SEM developed for this research model aims to determine how well the theory fits the empirical data by comparing the theoretically established measurement and structural model with the reality represented by the sample data (Hair et al., 2017). In other words, can the consumer behavioural intention to buy dairy products produced by manufacturers committed to CO_2 emission reduction be predicted by applying the two theoretical models – the BRT and the NAM.

PLS-SEM, developed by Hermann Wold (1982), works with two sets of linear equations, one for the inner (structural) model representing the constructs and the relationships between the constructs and one for the outer (measurement) model, displaying the relationship between the constructs and the indicator variables. The systematic evaluation of the PLS-SEM is conducted in two steps: firstly, the evaluation of the measurement model and, secondly, the assessment of the structural model. The steps include the estimation of latent construct scores, calculation of outer weights and loadings, as well as the path coefficients of the structural model (Henseler et al., 2009).

The evaluation of the measurement model includes the internal and discriminant validity. The structural model will be evaluated by the coefficients of determination measured with R^2, the predictive relevance (Q^2), and the size and significance of path coefficients, f^2 effect sizes and q^2 effect sizes. The assessment of the measurement and structural model will be discussed in detail in the next section.

7.4.1   Assessing the measurement model

The reflective measurement model will be assessed using different reliability and validity measurements. The evaluation of the structural model will only be conducted if reliability and validity of the measurement model can be established,.

In the first step, the different constructs were evaluated. The main measure used is face validity of the items, and items with low loadings will be omitted after careful considerations. Following this, the internal consistency reliability, evaluated by Cronbach's Alpha, and composite reliability is established for the different constructs. The last evaluation of the different constructs is convergent validity, which shows the correlation between the different items of one construct. In the second step, the different constructs and their relationships are assessed using different discriminant validity measures. Table 7.3 shows the different assessments and threshold criteria.

Criteria	What does it measure?	Measurement	Threshold	Recommendation
Indicator reliability	Evalutes, how precisely every indicator measures the related construct (latent variable)	factor loadings	> 0.7	
Internal consistency reliability	Estimates the reliability based on the intercorrelations of the observed indicators	Cronbach's Alpha	> 0.7	more conservative measure, often underestimates the internal consistency reliability, use as lower bound
		Composite reliability	> 0.6 - 0.7 for exploratory research > 0.7 - 0.9 for more advanced research > 0.95 not accepted	tends to overestimate the internal consistency reliability; use as upper bound
Convergent validity	Proportion of variance shared with other indicators of the same construct	Indicator validity	> 0.708 (0.7 acceptable)	outer loadings between 0.4 - 0.7 shall be considered for removal when it leads to increase in composite reliability or AVE
	The construct shall at least explain 50% of the variance of its indicators	Average variance extracted (AVE)	> 0.5	
Discriminant validity	Estimates the true correlation between two constructs, if they were perfectly measured.	Heterotrait-monotrait ratio (HTMT)	< 0.9 or 0.85	use HTMT
	Meassures the variance a construct shares with its associated indicators - shall be higher than with any other construct	Fornell Larcker criterion		not recommended; detection of discriminant validity issues poor, especially when indicator loadings of the constructs under consideration differ only slightly
	Indicators outer loadings on the associated constructs should be higher than any of it's cross loadings on other constructs	cross loadings		not recommended; lack of discriminant validity when two constructs are perfeclty correlated --> not recommended for empirical research

Table 7.3 Evaluation of reflective measurement models (Hair et al., 2017; Henseler et al., 2015; Hulland, 1999; Ringle et al., 2012)

7.4.1.1 Content and `face' validity

The constructs for this research are defined based on the literature – BRT ("reasons for"/"reasons against", attitude, social norms, behavioural control, and intention) and NAM (awareness of consequences, ascription of responsibility, and personal norms). The "reasons for" and "reasons against" have been defined in different reflective constructs based on the literature. A high number of reasons were considered in the questionnaire to get a clear picture of relevant "reasons for" and "reasons against" purchase intention considering CO_2 emission reduction.

Most of the outer loadings are above the threshold of 0.7, which suggests sufficient levels of indicator reliability (see Table 7.3). The indicator for outer loading should be above 0.7 (0.708) to assure that the latent variable explains a substantial part ($>=50\%$) of each indicator's variance. Items with loadings between 0.4 and 0.7 are evaluated regarding a possible negative effect on construct validity (Bagozzi et al., 1991; Hair et al., 2017) before a decision is taken.

Items with a factor loading < 0.4 are directly removed. Following Hulland (1999), the researcher examined the items with an outer loading of between 0.4 and 0.7 in detail before removing them. Seven items with lower loading (between 0.4 and 0.7) have been kept in the model. The researcher found that removing these items from the model did not improve the average variance extracted (AVE), composite reliability (CR), and/or Cronbach's Alpha. So, it was decided to keep the items that may help to explain parts of the constructs.

The following items have been removed: one item from awareness of consequences (Q16_8) and ascription of responsibility (Q17_5), two items from behavioural control (Q14_3, Q14_4) (*see* Appendix 1). The item Q17_5 was directly removed because of an outer loading < 0.4. The latent variable behavioural control (Q14) is critical for the analysis, which, after the deletion of 2 items (Q14_3, Q14_4), only contains 2 items to measure the construct. This embeds the risk that this construct cannot be represented sufficiently (Hair et al., 2017). However, due to the improvement of AVE, CR and Cronbach's Alpha when removing these items, the researcher decided for taking the items out, but considering behavioural control with only 2 items in the model. Behavioural control is one of the constructs used in the BRT. For Q16_8 showing an outer loading of 0.572, the decision to remove the item was taken after checking the AVE, CR and Cronbach's Alpha. Removing the item improved the AVE, the CR and Cronbach's Alpha. After removing this item, awareness of consequences is still explained by 8 items which is evaluated as sufficient (*see* Appendix 4 and 5).

For the "reasons for" and "reasons against" the items are first structured in the two different constructs. Especially concerning the "reasons against" just using one construct did not provide satisfying results. Based on the literature, the researcher divides the reason constructs in two different constructs for "reasons for", namely "environmental benefits" (EBE) and "trust" (TRU). Q9_1 is excluded from further analysis, because the question was not clearly focussing on the dairy industry compared to all other items. Regarding the "reason for" constructs Q9_10 is removed from "trust" (TRU), for "reasons against" following items are removed from "scepticism" (SCM) - Q10_2, Q10_7, Q10_8 and Q10_18 - and from "other decision criteria" (ODC) the item Q10_11. These six items were removed for following reasons; the outer loadings of Q10_8 and Q10_18 are < 0.4 and Q9_10, Q10_2, Q10_7, Q10_11 show outer loadings between 0.4 and 0.7 (*see* Appendix 2). Removing the four items with outer loadings between 0.4 and 0.7 improved the average variance extracted (AVE), composite reliability (CR)

and Cronbach's Alpha and hence are not considered as helpful for the explanation of the constructs (*see* Appendix 4 and 5).

After all items are evaluated and selected items are deleted, the factor loadings are considered to assure, that the items show the highest cross-loading with the corresponding construct while the cross loadings with other constructs are considerably lower (*see* Appendix 3). The factor loadings support the different reason constructs, but some loadings are considered as quite weak. To confirm the reason constructs, the researcher decided to evaluate the different constructs based on a polychoric factor analysis as a more accurate reproduction of the measurement model used to generate the data (Holgado-Tello et al., 2008) (*see* Appendix A.6). The quantitative variables are measured in intervals and are monotonic; hence it is possible to use the polychoric factor analysis. Five of the six reason constructs – environmental benefit, trust, scepticism, purchase criteria dairy and other purchase criteria - are unidimensional, whereas the criteria image of dairy shows a low eigenvalues. This construct is as well defined by only two indicators which embeds the risk that this construct cannot be represented sufficiently (Hair et al., 2017). For now, this construct will be kept in the model, and will be evaluated critically in the next steps. Consequently, all defined reason constructs will be considered in the model.

7.4.1.2 Internal consistency reliability

The internal consistency reliability is evaluated using Cronbach's Alpha and composite reliability. Cronbach's Alpha provides an estimate of reliability based on intercorrelations of the observed indicator variables (Hair et al., 2017). Cronbach's Alpha is sensitive to the number of items, which means that with a smaller number of items, Cronbach's Alpha will be lower. Table 7.4 shows that based on Cronbach's Alpha two constructs – image dairy and other decision criteria - are under the threshold of 0.7. This can be explained by the limited number of items (2 or 3 items per construct), which has an impact on the measurement. Cronbach's Alpha is described as a conservative measure, tending to underestimate the internal consistency. Therefore, the researcher chose to focus on composite reliability, measuring the consistency of each item with the construct, which takes the different outer loadings into consideration as well as the composite reliability. Values between 0.7 and 0.9 are considered as satisfactory. Values between 0.6 and 0.7 can be accepted in exploratory research. Values over 0.95 indicate that all indicators are measuring the same phenomenon and are not desirable (Hair et al., 2017). Table

7.4 shows that all CR values are between 0.7 and 0.95; the composite reliability has been accepted for all constructs. Considering that the 'true' reliability lies between Cronbach's Alpha and CR, the researcher evaluates the results as satisfactory (Hair et al., 2017).

7.4.1.3 Convergent validity

Convergent validity shows the extent to which a measurement correlates with other measures of the same construct. To evaluate the convergent validity of the reflective variables, which should share a high proportion of variance, the researcher considers the outer loadings and the average variance extracted (AVE). AVE describes the mean value of the squared loadings of the indicators associated with the construct (Hair et al., 2017). An AVE over the threshold of 0.5 indicates that the construct explains more than half of the variance of its indicators. In this research, all constructs showed an AVE> 0.5 and were accepted (*see* Table 7.4).

Measurement Model

		Items	Loadings[a]	AVE[b]	CR[c]	Cronbach's Alpha[d]
Reasons for	**Environmental benefits**	Q9_11	0.828	0.623	0.868	0.797
		Q9_2	0.716			
		Q9_3	0.819			
		Q9_4	0.788			
	Trust	Q9_5	0.692	0.538	0.852	0.788
		Q9_6	0.779			
		Q9_7	0.792			
		Q9_8	0.616			
		Q9_9	0.773			
Reaosns against	**Scepticism**	Q10_1	0.823	0.505	0.800	0.701
		Q10_3	0.772			
		Q10_4	0.626			
		Q10_5	0.594			
	Image dairy	Q10_6	0.821	0.642	0.782	0.442
		Q10_14	0.781			
	Purchase criteria dairy	Q10_9	0.721	0.565	0.839	0.745
		Q10_10	0.738			
		Q10_13	0.775			
		Q10_15	0.771			
	Other decision criteria	Q10_12	0.699	0.532	0.771	0.570
		Q10_16	0.655			
		Q10_17	0.824			
Attitude		Q11_1	0.834	0.686	0.939	0.926
		Q11_2	0.819			
		Q11_3	0.839			
		Q11_4	0.822			
		Q11_5	0.798			
		Q12_1	0.838			
		Q12_2	0.846			
Social Norms		Q13_1	0.893	0.736	0.933	0.915
		Q13_2	0.899			
		Q13_3	0.873			
		Q13_4	0.870			
		Q13_5	0.747			
Behavioural Control		Q14_1	0.911	0.807	0.893	0.762
		Q14_2	0.886			
Personal Norms		Q15_1	0.885	0.805	0.943	0.920
		Q15_2	0.907			
		Q15_3	0.903			
		Q15_4	0.895			
Awareness of Consequences		Q16_1	0.755	0.623	0.930	0.913
		Q16_2	0.800			
		Q16_3	0.803			
		Q16_4	0.739			
		Q16_5	0.814			
		Q16_6	0.842			
		Q16_7	0.750			
		Q16_9	0.784			
Ascription of responsibility		Q17_1	0.874	0.716	0.909	0.865
		Q17_2	0.884			
		Q17_3	0.859			
		Q17_4	0.761			
Intention		Q18_1	0.841	0.760	0.904	0.843
		Q18_2	0.909			
		Q18_3	0.863			

a All Item Loadings > 0.5 indicated indicator reliability (Hulland, 1999)

b All average variance extracted (AVE) > 0.5 indicates convergent reliability (Bagozzi and Yi (1988); Fornell and Larcker (1981))

c All composite reliability (CR) > 0.7 indicates interal consistency (Gefen et al., 2000)

d All Cronbach's Alpha > 0.7 indicates indicator reliability (Nunnally, 1978)

Table 7.4 Evaluation of measurement model - reliability and validity measures

7.4.1.4 Discriminant Validity

Discriminant validity measures the extent to which a construct is truly distinct from other constructs and captures phenomena not represented by other constructs. To evaluate the discriminant validity, three different approaches have been applied.

Cross loadings:

The cross-loadings are used to assess whether the outer loadings of the indicator with the associated construct is greater than any of its cross loadings on other constructs. In this research, each item loads strongly onto only one construct; therefore, discriminant validity has been established (*see* Appendix A.7).

Fornell-Larcker criterion:

The Fornell-Larcker criterion compares the square root of the AVE values with the latent variable correlations. The square root of the AVE should be greater than its highest correlation with any other construct, which applies for all the constructs in the model as shown in Table 7.5. In this table the square root of AVE is displayed in diagonal.

Fornell-Larcker Criterion	AR	AT	AC	BC	EBE	IMD	IT	ODC	PCM	PN	SCM	SN	TRU
Ascription of responsibility (AR)	**0.846**												
Attitude (AT)	0.519	**0.828**											
Awareness of consequences (AC)	0.706	0.556	**0.789**										
Behavioural control (BC)	0.297	0.257	0.277	**0.899**									
Environmental benefit (EBE)	0.565	0.522	0.553	0.318	**0.789**								
Image of dairy (IMD)	0.307	0.190	0.305	0.160	0.314	**0.801**							
Intention (IT)	0.664	0.676	0.679	0.389	0.623	0.260	**0.871**						
Other decision criteria (ODC)	-0.001	-0.088	-0.114	0.060	0.052	0.277	-0.063	**0.729**					
Purchase criteria dairy (PCD)	-0.235	-0.309	-0.261	-0.139	-0.266	0.146	-0.379	0.376	**0.752**				
Personal Norm (PN)	0.702	0.649	0.701	0.391	0.642	0.321	0.789	-0.059	-0.324	**0.897**			
Scepticism (SCM)	-0.173	-0.322	-0.256	-0.097	-0.198	0.230	-0.297	0.449	0.619	-0.239	**0.710**		
Social Norms (SN)	0.520	0.437	0.480	0.426	0.470	0.270	0.567	0.053	-0.180	0.657	-0.121	**0.858**	
Trust (TRU)	0.499	0.384	0.409	0.448	0.664	0.298	0.553	0.159	-0.212	0.563	-0.086	0.554	**0.733**

Table 7.5 Fornell-Larcker criterion to establish discriminant validity of the constructs

Heterotrait-monotrait ratio (HTMT):

Heterotrait-monotrait ratio (HTMT) (Henseler et al., 2015) calculates the mean of all correlations of indicators across constructs, which measures different constructs relative to the mean of the average correlations of indicators measuring the same construct (Hair et al., 2017). HTMT estimates the true correlation of two constructs if they could be perfectly measured. If the correlation of the constructs is close to 1, a lack of discriminant validity is indicated. The HTMT has been established because research conducted by Henseler et al. (2015) identified

problems with the ability of cross loadings and Fornell-Larcker criterion to identify discriminant validity. A threshold of < 0.9 when the constructs are conceptually very similar and of < 0.85 when the constructs are more distinct from each other is established. All constructs show HTMT values below 0.85 with the exception of personal norms, which is below 0.9 (see Table 7.6). Therefore, the HTMT ratio confirmed the discriminant validity already established by cross loadings and the Fornell-Larcker criterion and, thus, does not denote a problem for this research.

HTMT	AR	AT	AC	BC	EBE	IMD	IT	ODC	PCM	PN	SCM	SN	TRU
Ascription of responsibility (AR)													
Attitude (AT)	0.574												
Awareness of consequences (AC)	0.790	0.602											
Behavioural control (BC)	0.361	0.306	0.331										
Environmental benefit (EBE)	0.677	0.602	0.644	0.410									
Image of dairy (IMD)	0.498	0.292	0.485	0.278	0.530								
Intention (IT)	0.771	0.767	0.774	0.482	0.756	0.429							
Other decision criteria (ODC)	0.047	0.117	0.165	0.104	0.073	0.546	0.096						
Purchase criteria dairy (PCD)	0.281	0.369	0.307	0.182	0.336	0.264	0.469	0.570					
Personal Norm (PN)	0.781	0.700	0.762	0.465	0.747	0.505	**0.896**	0.086	0.383				
Scepticism (SCM)	0.193	0.350	0.260	0.170	0.230	0.462	0.363	0.707	0.846	0.260			
Social Norms (SN)	0.579	0.470	0.523	0.510	0.553	0.430	0.644	0.099	0.210	0.720	0.153		
Trust (TRU)	0.585	0.420	0.460	0.572	0.819	0.504	0.657	0.231	0.286	0.646	0.158	0.656	

Table 7.6 Heterotrait-monotrait ratio (HTMT) to establish discriminant validity of the constructs

Additionally, it has been examined whether the HTMT values are significantly different from 1, as recommended by Hair et al. (2017), to support the discriminant validity. To receive the bootstrap confidence intervals, a complete bootstrapping has been calculated in SmartPLS with 5000 sub-samples and a significance level of 5%. The bias-corrected and accelerated (BCa) bootstrap result was chosen as a confidence interval method. The bootstrap confidence interval – the range within which the true population will fall assuming the chosen level of confidence – provides additional information on the stability of the estimated coefficient. Furthermore, the range of the confidence interval provides the researcher with an indication of the stability of the measurement.

The results showed that neither of the confidence intervals includes the value of 1. The lower and upper bounds of the confidence interval of the relationship between personal norms and intention are 0.865 and 0.924. Even though the HTMT criteria of this relationship was measured at 0.896, which is close to 0.9, the bootstrap confidence interval did not include a value of 1; this result confirms the discriminant validity

Following the results of the different methods to evaluate the discriminant validity – cross loadings, Fornell-Larcker criterion, and HTMT - all three meet the necessary threshold criteria and discriminant validity is established.

7.4.1.5 Conclusion

In this chapter, the quality of measurement model has been evaluated by assessing its reliability and validity. After deleting a number of items with low factor loadings, the model shows satisfactory outcomes for indicator reliability, composite reliability, convergent validity, and discriminant validity as summarised in Table 7.7. The next section assesses relationships in the structural model.

Results Summary for the Measurement Model			Convergent Validity			Internal Consistency Reliability		Discriminant Validity
Latent variable		Indicators	Loadings	Indicator Reliability	AVE	Composite Reliability	Cronbach's Alpha	
			>0.70	>0.50	>0.50	0.60 - 0.89	0.60 - 0.90	interval does not
Reasons for	**Environmental Benefits**	Q9_11	0.828	0.686	0.623	0.868	0.797	yes
		Q9_2	0.716	0.513				
		Q9_3	0.819	0.671				
		Q9_4	0.788	0.621				
	Trust	Q9_5	0.692	0.479	0.538	0.852	0.788	yes
		Q9_6	0.779	0.607				
		Q9_7	0.792	0.627				
		Q9_8	0.616	0.379				
		Q9_9	0.773	0.598				
Reaosns against	**Skepticism**	Q10_1	0.823	0.677	0.505	0.800	0.701	yes
		Q10_3	0.772	0.596				
		Q10_4	0.626	0.392				
		Q10_5	0.594	0.353				
	Image dairy	Q10_6	0.821	0.674	0.642	0.782	0.442	yes
		Q10_14	0.781	0.610				
	Purchase criteria dairy	Q10_9	0.721	0.520	0.565	0.839	0.745	yes
		Q10_10	0.738	0.545				
		Q10_13	0.775	0.601				
		Q10_15	0.771	0.594				
	Other decision criteria	Q10_12	0.699	0.489	0.532	0.771	0.570	yes
		Q10_16	0.655	0.429				
		Q10_17	0.824	0.679				
Attitude		Q11_1	0.834	0.696	0.686	0.939	0.926	yes
		Q11_2	0.819	0.671				
		Q11_3	0.839	0.704				
		Q11_4	0.822	0.676				
		Q11_5	0.798	0.637				
		Q12_1	0.838	0.702				
		Q12_2	0.846	0.716				
Social Norms		Q13_1	0.893	0.797	0.736	0.933	0.915	yes
		Q13_2	0.899	0.808				
		Q13_3	0.873	0.762				
		Q13_4	0.870	0.757				
		Q13_5	0.747	0.558				
Behavioural Control		Q14_1	0.911	0.830	0.807	0.893	0.762	yes
		Q14_2	0.886	0.785				
Personal Norms		Q15_1	0.885	0.783	0.805	0.943	0.920	yes
		Q15_2	0.907	0.823				
		Q15_3	0.903	0.815				
		Q15_4	0.895	0.801				
Awareness of Consequences		Q16_1	0.755	0.570	0.623	0.930	0.913	yes
		Q16_2	0.800	0.640				
		Q16_3	0.803	0.645				
		Q16_4	0.739	0.546				
		Q16_5	0.814	0.663				
		Q16_6	0.842	0.709				
		Q16_7	0.750	0.563				
		Q16_9	0.784	0.615				
Ascription of responsibility		Q17_1	0.874	0.764	0.716	0.909	0.865	yes
		Q17_2	0.884	0.781				
		Q17_3	0.859	0.738				
		Q17_4	0.761	0.579				
Intention		Q18_1	0.841	0.707	0.760	0.904	0.843	yes
		Q18_2	0.909	0.826				
		Q18_3	0.863	0.745				

Table 7.7 Summary of the quality indicators for the measurement model

7.4.2   Assessing the structural model

Following the evaluation of the measurement model which showed satisfactory outcomes, the structural model will be assessed in detail using heuristic criteria determined by the model's predictive capabilities. In the first step, the structural model will be assessed for collinearity issues among the predictors to assure that the path coefficients are not biased. In the second step, the significance of the path coefficients will be established. The level of the R^2 in the third step shows the predictive power of the model. In the following step, the effect size f^2 measures the impact of the exogenous construct on the endogenous construct, showing whether a construct has a substantive impact on the endogenous construct. The Stone-Geiser's Q^2 value measures the out-of-sample predictive power of the model, i.e. the predictive relevance. The last measure is the q^2 effect size, which compares the predictive relevance of the model with and without the construct.

7.4.2.1 Collinearity issues

The first step in assessing the structural model is to check the structural model for collinearity issues by examining the Variance Inflation Factor (VIF) values of all sets of predictor constructs. The VIF describes the degree to which the standard error has been increased due to collinearity issues. If collinearity issues appear, one should consider eliminating constructs, merging constructs, or creating higher order constructs to treat the problem. The following constructs will be assessed for collinearity:

(1) Environmental Benefits (EBE), Trust (TRU), Scepticism (SCM), Purchase Criteria Dairy (PCD), Image of Dairy (IMD), Other Decision Criteria (ODC), Personal Norm (PN) as predictors for Attitute (AT), (2) Awareness of Consequences (AC) and Ascription of Responsibility (AR) as predictor for PN and (3) AT, Behavioural Control (BC), Social Norms (SN), PN as predictor for Intention (IT). The threshold for collinearity in the PLS-SEM is VIF of above 5 (following Hair et al., 2011)

All VIF values in the model are below the threshold of 5 and, therefore, collinearity among the predictor constructs is not an issue (*see* Table 7.8).

Inner VIF values threshold < 5	AT	PN	IT
Environmental benefit (EBE)	2.273		
Image of dairy (IMD)	1.349		
Other decision criteria (ODC)	1.407		
Purchase criteria dairy (PCD)	1.806		
Scepticism (SCM)	1.859		
Trust (TRU)	2.005		
Social Norms (SN)			1.870
Behavioural control (BC)			1.255
Attitude (AT)			1.727
Awareness of consequences (AC)		2.006	
Ascription of responsibility (AR)		2.006	
Personal Norm (PN)	2.008		2.506

Table 7.8 Inner VIF values to indicate collinearity issues

7.4.2.2 Significance and relevance of the structural model relationships

The second step estimates the structural model relationships and the path coefficients, which represent the hypothesized relationships among the different constructs. For this analysis, the *t* values based on bootstrapped standard errors are evaluated. The number of observations exceeds the threshold of 30 and the normal quantiles can be used to determine the critical *t* values for significance testing of the different paths. The path coefficient is considered to be significantly different from 0 at a significance level of 5% (a=0.05; one-tailed test) when the resulting *t* value is above 1.65 (Hair et al., 2017).

Table 7.9 show the results of the significance test for the structural model path coefficients. Looking at the drivers of attitude initially, Table 7.9 shows that three of them – PN, EBE, and SCM – are significant, whereas four path coefficients – IMD, ODC, TRU, and PCD – have a non-significant effect on attitude. Looking at the relative importance (path coefficients) of the exogenous driver constructs for IT, PN is the most important driver, followed by AT (*see* Table 7.9). AC and AR show that PN is very important. The following analysis will focus on the strength of the structural paths for the endogenous variables: AR, AT, PN, and IT.

Significance Testing Results of Structural Model Path Coefficients	Path Coefficient	*t* Values	Significance[1] (p<0,05)
AR --> PN	0.413*	10.691	yes
AT --> IT	0.285*	9.112	yes
AC --> AR	0.706*	31.499	yes
AC --> PN	0.410*	10.524	yes
BC --> IT	0.082*	3.410	yes
EBE --> AT	0.184*	4.784	yes
IMD --> AT	0.020	0.663	no
ODC --> AT	0.016	0.514	no
PCD --> AT	-0.006	0.164	no
PN --> AT	0.510*	13.363	yes
PN --> IT	0.537*	16.490	yes
SCM --> AT	-0.176*	4.890	yes
SN --> IT	0.054*	1.851	yes
TRU --> AT	-0.051	1.422	no

[1] Bootstrap confidence intervall as decision criterium (Hair et al., 2017)

*Significant path coefficient threshold one-tailed test t>1,65

Table 7.9 Path coefficients and their significance

7.4.2.3 Coefficient of determination (R^2 value)

In the next step, the model will be evaluated based on the R^2 value, the coefficient of determination, meaning the strength of each structural path determined by the R^2 value for the dependent variable. This value measures the predictive power of the model and is calculated as the squared correlation between a specific endogenous construct's actual and predictive value. The coefficient represents the endogenous construct explained by all of the exogenous constructs linked to it. Following Hair et al. (2011) and Henseler et al. (2009), R^2 values for endogenous variables of 0.75 are described as substantial, 0.50 as moderate, and 0.20 as weak. The R^2 values of the endogenous latent variable are 0.468 for AT, 0.499 for AR, 0.577 for PN, and 0.678 for IT – all are considered moderate.

R square	R^2
Ascription of responsibility	0,499
Attitude	0,468
Personal Norm	0,577
Intention	0,678

Table 7.10 R^2 value to evaluate the predictive capabilities of paths examined - Research Model

The research framework combines the BRT and the NAM. To evaluate the predictive power of the two separate models, two different calculations were conducted. Table 7.10.1 shows R^2 for the BRT, the NAM and the NAM without the path between PN and AT. All models indicate a moderate predictive power. It becomes clear that in the combined model R^2 for AT increases due to the effect of PN on AT. Interesting is that even though PN has a strong effect on AT, this effect does not increase the predictive power of the model, meaning that PN explains a part of AT, but the weak effect of PN on AT does not improve the predictive power of the whole model.

R square - BRT	R_1^2
Attitude	**0,339**
IT	0,563
R square - NAM	R_2^2
AR	0,499
PN	0,577
IT	0,622
R square - NAM (without path PN -> AT)	R_3^2
AR	0,499
Attitude	**0,339**
PN	0,577
IT	0,678

Table 7.11.1 Different R^2 value to evaluate the predictive capabilities of paths examined

7.4.2.4 Effect size f^2

The effect size f^2 is calculated from the R^2 values when an exogenous construct is included in or excluded from the model. Guidelines for assessing f^2 note that values of 0.02 present a small effect, 0.15 a medium one, and 0.35 a large effect (Cohen, 1988) on the exogenous latent variable. If the effect size is less than 0.02, no effect of the variable is indicated. As shown in Table 8.11, the impact of PN on IT is large (>.350) and medium on AT (0.243). As seen in Table 7.11, AR and AC show medium effect sizes on PN, as does AT on IT. Other effect sizes like EBE and SCM on AT are small. The exogenous latent variables of IMD, OPD, and TRU do not show an effect on AT, nor do BC and SN on IT.

f^2	AR	AT	PN	IT
Environmental benefit (EBE)		0.028		
Image of Dairy (IMD)		0.001		
Other decision criteria (ODC)		0.000		
Purchase criteria dairy (PCD)		0.000		
Scepticism (SCM)		0.031		
Trust (TRU)		0.002		
Social Norms (SN)				0.005
Behavioural control (BC)				0.017
Attitude (AT)				0.146
Ascription of responsibility (AR)			0.202	
Awareness of consequences (AC)	0.995		0.199	
Personal Norm (PN)		0.243		0.357

Table 7.12 Effect sizes f^2

The total effects in Table 7.12 show which exogenous construct has the highest total effect on the target construct: AR, AT, PN and IT. Considering the purchase intention for dairy products produced under consideration of the CO_2 emission reduction, PN shows the strongest effect, followed by AC, AR. Looking at intention, PN generates the highest effect, followed by AC, AR, AT.

Total Effects	AR	AT	PN	IT
Environmental benefits (EBE)		0.184		0.052
Image dairy (IMD)		0.020		0.006
Other decision criteria (ODC)		0.016		0.004
Purchase criteria dairy (PCD)		-0.006		-0.002
Scepticism (SCM)		-0.176		-0.050
Trust (TRU)		-0.051		-0.014
Social Norms (SN)				0.054
Behavioural Control (BC)				0.082
Attitude (AT)				0.285
Ascription of responsibility (AR)		0.210	0.413	0.281
Awareness of consequences (AC)	0.706	0.357	0.701	0.478
Personal Norms (PN)		0.510		0.682

Table 7.13 Total effects

The total effects measured show how strongly the driver constructs influence the key target variable (*see* Table 7.12). With regards to consumer behavioural intention PN (0.682) has the

strongest effect on IT amongst the exogenous variables, followed by AC (0.478), AT (0.285) and AR (0.281).

Analysing AT, the only construct of the BRT with a strong effect on IT, a strong influence of PN (0.510), AC (0.357), and AR (0.210) can be seen. This result shows that even the construct AT, as part of the BRT, is strongly influenced by the constructs represented in the NAM: PN, AC, and AR. Therefore, the effect of AT on IT (0.285) is partly explained by the NAM constructs.

These results indicate the importance of the constructs of the NAM in the context of consumer intention building related to purchasing dairy products produced under the consideration of CO_2 emission reduction. Based on these findings, it is advised that dairy companies should focus on marketing and public relations activities that strengthen consumer personal norms and awareness of the consequences. To strengthen the AT, focus should be placed on EBE (0.184) and SCM (-0.176): EBE describes the environmental benefits of buying dairy products produced under the consideration on the CO_2 emission reduction, whereas SCM describes scepticism, including general scepticism towards the commitment of companies to CO_2 emission reduction and the effect of consumers' own commitment and activity. Looking at EBE, there should be a focus on companies showing commitment to CO_2 emissions reduction, increase in number of companies joining in, as well as on the effect of CO_2 emissions reduction for future generations. Scepticism is mainly associated with the lack of trust that an individual's own commitment can make a difference.

Significance Testing Results of Total Effects	Total Effect	*t* Values	Significance[1] (p<0.05)
AR --> IT	0.281	9.551	yes
AC --> IT	0.478	18.050	yes
PN --> IT	0.682	25.899	yes
AT --> IT	0.285	9.112	yes
EBE --> IT	0.052	4.061	yes
IMD --> IT	0.006	0.669	no
ODC --> IT	0.004	0.510	no
PCD --> IT	-0.002	0.163	no
SCM --> IT	-0.050	4.422	yes
TRU --> IT	-0.014	1.385	no
SN --> IT	0.054	1.851	yes
BC --> IT	0.082	3.410	yes

[1] Bootstrap confidence intervall as decision criterium (Hair et al., 2017)

*Significant path coefficient threshold one-tailed test t>1,65

Table 7.14 Significance Testing Results of Total Effects

Table 7.13 shows the total effects after bootstrapping. The constructs AR, AC, PN, AT show significant effects on IT, as well as the two reason constructs EBE and SCM. The strongest total effect on IT is performed by PN, followed by AC. AT and AR show similar total effects on IT.

7.4.2.5 Predictive relevance Q^2

Q^2 establishes the predictive relevance of the endogenous constructs. To obtain Q^2 the blindfolding procedure for an omission distance of D=8 was used. In the blindfolding technique every 8th data point is omitted in the endogenous construct's indicators and the parameters with the remaining data points is estimated (Chin, 1998; Henseler et al., 2009; Tenenhaus et al., 2005). D=8 is used, which means that 12.5% of the data are omitted per blindfolding round, which lies in the recommended range between 5 and 10 (Hair et al., 2012), and the number of observations (n= 791) divided by D (D=8) is not an integer.

$Q^2 > 0$ shows that the model has predictive relevance. The results show that all four endogenous variables exceed 0, confirming the predictive relevance of the constructs AR, AT, PN, IT (see Table 7.14)

Q square	Q^2
Ascription of responsibility	0.351
Attitude	0.316
Personal Norm	0.461
Intention	0.510

Table 7.15 Q^2 showing the predictive relevance of the endogenous constructs

7.4.2.6 Effect size q2

The relative predictive relevance of the different endogenous constructs is measured with q^2. Endogenous constructs in the model are AT, PN, AR, and IT. As constructs, only the constructs with a significant effect on the endogenous constructs have been considered – EBE, SCM, AT, AC, AR, and PN.

q^2 Effect Sizes	AT	PN	IT
EBE	0.0146		
SCM	0.0161		
AC		0.1113	
AR	-0.0015	0.1262	
AT			0.0102
PN	0.1287		0.0286

Table 7.16 Predicted relevance of exogenous constructs

As seen in Table 7.15, there is no endogenous variable with a medium or high effect when a specific predecessor of that endogenous latent construct is removed from the model. Small effects sizes with a threshold of $q^2 > 0.02$ following relationships can be considered: $q^2_{(PN \to AT)}$, $q^2_{(PN \to IT)}$, $q^2_{(AR \to PN)}$, and $q^2_{(AC \to PN)}$. This means that none of the endogenous latent constructs alone show a medium or large effect within this model.

Furthermore, the model fit is assessed using SRMR, which requires a value of <0.10 to indicate an acceptable model fit (Hair et al., 2017). With 0.055, the SRMR is under the threshold and supports the model fit.

7.4.3 Mediation and moderation analysis

7.4.3.1 Mediation analysis

Two mediation roles are examined in this research – firstly, the relationship between AC and PN, mediated by AR, and the relationship between PN and IT, mediated by AT.

As described in Chapter 5, this research follows the NAM as mediator model (Steg and de Groot, 2009) and two mediation effects will be examined: the mediation of AC by AR on PN; and the mediation of AC by PN on IT.

Firstly, the mediation role of AR will be examined. This effect follows the definition of the NAM as a mediator model (Steg and de Groot, 2009). AC shows a total effect on PN of 0.410 (see Table 7.16). This effect is partly direct and partly indirect, and is mediated by AR. AC exerts a pronounced (0.410) and significant direct effect on PN (t=10.572; p<0.05). The indirect effect is also significant (b=0.292; t=10.349). Therefore, it is concluded that AR partially mediates the relationship between AC and PN, since the direct and indirect effects are significant. Both effects, are positive, and a complementary mediation of the relationship from AC to PN is represented by AR.

The findings provide empirical support for the mediating role of AR in the Norm Activation Model, which means that AR serves as a complementary mediator for the relationship between AC and PN. Higher levels of AC increase PN directly and also increase AR, which in return leads to higher PN. In conclusion, some of the effects of AC are explained by AR.

Secondly, AT's role as a mediator of the effect of PN on IT will be analysed. PN shows a total effect of 0.537 on IT (*see* Table 7.16). The effect can be explained by the significant and positive direct effect of PN on IT (b=0.537; t=16.309), and the significant, but much weaker indirect effect of 0.145 (t=7.450). Hence, AT partially mediates the relationship between PN and IT. Both effects are positive and a complementary mediation of the relationship from PN to IT is represented by AT.

The empirical support for the mediation role of AT extends the findings of former research and supports the framework for this research. Higher levels of PN not only increase IT directly, but also increase AT, which leads to higher IT. Consequently, some of the effects of PN are explained by AT.

	Direct effect	95% confidence interval of the Direct Effect	t Value	Significance (p< 0.05)?	Indirect effect	95% confidence interval of the Indirect Direct Effect	t Value	Significance (p< 0.05)?
AC --> PN	0.410	[0.331, 0.483]	10.694	yes	0.292	[0.237, 0.348]	10.349	yes
PN --> IT	0.537	[0.472, 0.599]	16.298	yes	0.145	[0.112, 0.188]	7.450	yes

Table 7.17 Mediation effects

To conclude, this research confirms the use of the NAM as a mediator model. Moreover, the results contribute to academic discussion by confirming that AT serves as a mediator for the effect of PN on IT when the BRT and NAM are integrated in one research model. This finding also shows that, in the context of the consumer purchase decision for dairy products produced under the consideration of CO_2 emission reduction, the effect of AT on IT is strongly determined by PN.

7.4.3.2 Moderator analysis – gender and education level

The second stage of the analysis is to test whether the relationships in the research model are moderated by gender and/or education level. The literature review discussed several studies in the pro-environmental context where gender and education level show a moderating effect. However, the results are inconclusive.

Gender and education level, both represent observable traits. For gender, female and male are considered, and for education, three groups are considered – lower education level ("kein Schulabschluss", "Hauptschulabschluss", "Mittlere Reife"), middle education level ("Abitur/Fachabitur", "abgeschlossene Berufsausbildung", "Fachwirt/Meister") and high education level ("Bachelor", "Master", "MBA", "Promotion").

The goal is to identify relationships in the model, which vary significantly between the different groups under investigation (Hair et al., 2017). The advantage is that the analysis gives a complete picture of the moderator's influence on the results of the analysis across the board, from one specific model relationship to all model relationships.

For the analysis, the permutation test (Chin, 2003; Chin and Dibbern, 2010) was chosen, which allows researchers to test whether the path coefficients differ in different populations. The

advantage of the permutation test compared with multigroup analysis is that the former offers allows the researcher to conduct a two-sided test. The two-sided test carries an advantage, when no *a priori* expectations about the differences between the groups exists. Even though the researcher had some expectations about the group differences, these were not clearly defined by prior research. Therefore, the researcher decided to use the two-tailed test. The permutation test reliably controls type I errors when the assignment of observations occurs randomly, as in PLS-SEM; therefore, it is more conservative in parametric tests when it comes to significant differences (Sarstedt et al., 2011). Before applying the permutation test, it is important to assure that the group sample sizes is not too different, which means that one group's sample should not be more than double the size of the other groups. In such cases, the PLS-MGA or the parametric approach is preferred (Hair et al., 2018).

Gender

The dataset includes n= 790, with $n^{female} = 400$ and $n^{male} = 390$. To examine the moderating effect of gender, the dataset is split into two groups – female and male. The category "diverse", used in German surveys to offer the respondents the chance to choose a third option if they do not consider that they belong to any of the existing groups, will not be considered because only one respondent marked this category.

To be able to compare the different groups, it has to be assured that the variations in the structural relationships stem for the different meanings the respondents attribute to the measured constructs and is not caused by differences in the structural relationships (Hair et al., 2018).

The measurement invariance of composite models (MICOM) form the measurement invariance techniques, which can be applied to the PLS-SEM. The latent variables in a PLS-SEM are represented as composites, the scores of the latent variables, which are the linear combinations of indicators and indicator weightings (Hair et al., 2018). The MICOM procedure consists of three consecutive steps: (1) the configural invariance; (2) the compositional invariance; *and* (3) the equality of composite mean values and variances.

1. **Configural invariance** assures that each variable in the path model has been specified equally for all groups – identical indicators, identical data treatment, and identical algorithm

settings or optimisation criteria (Hair et al., 2018). For the purposes of this research, the constructs have been equally parameterised and estimated across the gender groups and configural invariance has been established. In the second step, the path coefficients will be examined in the compositional invariance.

2. **Compositional invariance** exists when the composite scores are the same across the two gender groups, meaning that the composite scores of the latent variables are correlated and measurement invariance is established. To test the composite invariance, the permutation test is applied. The samples sizes for of females ($n^{female} = 400$) and males ($n^{male} = 390$) is similar. The maximum number of arrows pointing to a latent variable is seven; therefore, we need at least 7x10=70 observations in each group according to the 10 times rule (Hair et al., 2018), which is followed in this research. A number of 1000 permutations and two-tailed testing have been recommended as a minimum by Hair et al. (2018). The significance level was set to 0.05. Table 7.17 shows the compositional invariance assessment. Following Hair et al. (2018), the results reveal that the permutation p-values are larger than 0.05 and the original correlation of all constructs is not significantly different from 1, which supports the conclusion that compositional invariance has been established for all constructs.

Compositional invariance assessment	Original Correlation	Correlation Permutation Mean	5.0%	Permutation p-Values
Ascription of responsibility	1.000	1.000	0.999	0.354
Attitude	1.000	1.000	1.000	0.262
Awareness of consequences	1.000	1.000	1.000	0.890
Behavioural control	1.000	0.999	0.994	0.874
Environmental benefit	1.000	0.999	0.997	0.842
Image of Dairy	0.939	0.978	0.914	0.092
Intention	1.000	1.000	1.000	0.182
Other decision criteria	0.699	0.810	0.351	0.194
PCD	0.994	0.994	0.983	0.367
Personal Norm	1.000	1.000	1.000	0.793
Scepticism	0.991	0.988	0.961	0.447
Social Norms	0.999	1.000	0.999	0.065
Trust	0.995	0.997	0.992	0.206

Table 7.18 Compositional invariance assessment gender groups

3. To check whether the **full measurement invariance** holds the composite scores of the mean value, variance of the original model estimation, and the permutation procedure are examined. The difference from Step 2 is that the data of the whole model are used and the scores are assigned to each group *ex post* (Hair et al., 2018).

The results reveal that the difference between the mean values of the latent variable scores fall within the corresponding confidence interval, indicating that there is no significant difference in the mean values of the latent variables (*see* Table 7.18). The p-values are all above 0.05 and support this finding. An exception is BC. For BC, there is a significant difference between the two gender groups and partial measurement invariance cannot be established. Hence, group-specific comparisons using a multigroup analysis involving this latent variable are not feasible and will not be considered for the group-specific analysis (Hair et al., 2018).

Full measurement invariance	Mean - Original Difference (Female - Male)	Mean - Permutation Mean Difference (Female - Male)	2.5%	97.5%	Permuta-tion p-Values	Variance - Original Difference (Female - Male)	Variance - Permutation Mean Difference (Female - Male)	2.5%	97.5%	Permuta-tion p-Values
Ascription of responsibility	-0.071	0.001	-0.144	0.147	0.323	0.005	-0.005	-0.227	0.207	0.956
Attitude	-0.116	0.003	-0.127	0.138	0.087	0.102	-0.001	-0.195	0.199	0.326
Awareness of consequences	-0.061	0.003	-0.129	0.151	0.393	0.100	-0.003	-0.262	0.241	0.450
Behavioural control	0.189	0.002	-0.130	0.143	0.009	0.000	0.009	-0.188	0.205	0.995
Environmental benefit	-0.105	0.002	-0.130	0.139	0.126	0.128	-0.001	-0.169	0.163	0.142
Image of Dairy	-0.034	0.000	-0.135	0.144	0.632	0.027	-0.003	-0.154	0.148	0.712
Intention	-0.079	0.000	-0.131	0.142	0.254	0.142	-0.003	-0.233	0.236	0.237
Other decision criteria	-0.076	0.001	-0.138	0.135	0.286	0.046	-0.004	-0.175	0.152	0.610
PCD	0.052	0.000	-0.135	0.132	0.460	0.056	-0.001	-0.158	0.151	0.425
Personal Norm	-0.084	0.003	-0.135	0.151	0.237	-0.025	0.000	-0.227	0.225	0.822
Scepticism	0.062	-0.002	-0.139	0.140	0.365	0.061	0.001	-0.161	0.166	0.456
Social Norms	-0.064	-0.001	-0.153	0.143	0.373	-0.052	0.004	-0.192	0.200	0.611
Trust	-0.084	-0.001	-0.154	0.134	0.255	0.048	-0.003	-0.152	0.151	0.555

Table 7.19 Full measurement invariance analysis gender groups

The composite variance shows that all confidence intervals include the original value, and the p values are larger than 0.05. Thus, all composite mean values and variances are equal and support the full measurement invariance of the two gender groups with the exception of BC. To continue with the multigroup analysis, the permutation results for the path coefficients will be examined.

Multigroup analysis

With the multigroup analysis tests, the path coefficients are examined. The aim of this analysis is to show whether the path coefficients of the two gender groups show a significant difference. The researcher chose the PLS-MGA because this test provides an indication as to whether the "as expected" path coefficients in the female group are significantly larger than in the male group.

PLS-MGA

To further analyse the group specific effects, another multigroup approach is conducted. The PLS-MGA is a one-tailed test and indicates whether the path coefficients in the female group are significantly larger than in the male group. This is the case for IMD on AT, meaning that the path coefficient is significantly larger for the female group (*see* Table 7.19). The relationship between ODC and AT is 0.053, just over the p-value of 0.05, meaning that it is not significant.

PLS_MGA	Path Coefficients-diff (Female - Male)	p-Value original 1-tailed (Female vs Male)	p-Value new (Female vs Male)
AR --> PN	-0.039	0.692	0.616
AT --> IT	0.027	0.331	0.662
AC --> AR	0.036	0.211	0.422
AC --> PN	0.026	0.368	0.737
EBE --> AT	-0.026	0.628	0.743
IMD --> AT	**0.187**	**0.001**	**0.001**
ODC --> AT	-0.133	0.973	0.053
PCD -> AT	0.026	0.354	0.707
PN --> AT	-0.071	0.818	0.364
PN --> IT	-0.010	0.561	0.879
SKM --> AT	-0.070	0.833	0.334
SN --> IT	0.049	0.203	0.406
TRU --> AT	-0.047	0.746	0.509

Table 7.20 PLS_MGA gender groups

To check whether the permutation test, parametric test, and Welch Satterthwaite, provide the same result, the researcher conducted the analysis and reported it in the Appendix. The different test approaches lead to similar results; only the permutation test recommended by Hair et al.

(2017) indicates that the path coefficients of gender are different for ODC to AT. All other path coefficients do not show a difference when it comes to gender (*see* Appendix A.8).

Aligning the results with the findings for the relationship between IMD,AT, and IT - effect size (*see* Table 7.12) and total effect (*see* Table 7.13) –gender differences do not play a role in the context of this research. The effect of gender in the model is limited to the path from IDM to AT; for all other path coefficients, no effect could be established. These results lead to the conclusion that, for the relevant paths within this research model, gender does not lead to different behavioural patterns in the context of the behavioural decision to buy dairy products produced by companies that are committed to CO_2 emission reduction. Therefore, no moderation effect of gender is established in this research.

Education level

For the educational level, three groups are compared –high level, middle level and low level.

As described in the previous section, the MICOM procedure will also be applied for the different education levels. First, the configural invariance, followed by the compositional invariance, and then the equality of composite mean values and variances, will be conducted. The theoretical discussion of the different tests will refer back to the gender section.

1. Configural invariance is established because the constructs have been equally parameterised and estimated across the education level groups.

2. Compositional invariance is checked across all three group combinations – high level versus low level, high level versus mid-level, and mid-level versus low level. Apart from two constructs – AC and TRU – in the high level versus mid-level education comparison, compositional invariance is established ($p<0.05$) (*see* Table 7.20). For AC and TRU the compositional invariance could not be substantiated which means that the standardised path coefficients for all paths involving the constructs AC and TRU cannot be compared across the groups.

Compositional Invariance	Permutation p-values		
Education level	High vs Low	High vs Mid	Mid vs Low
Ascription of responsibility (AR)	0.932	0.602	0.613
Attitude (AT)	0.060	0.123	0.774
Awareness of consequences (AC)	0.199	**0.006**	0.106
Behavioural control (BC)	0.252	0.550	0.259
Environmental benefit (EBE)	0.999	0.193	0.411
Image of Dairy (IMD)	0.909	0.556	0.396
Intention (IT)	0.107	0.170	0.226
Other decision criteria (ODC)	0.822	0.440	0.900
Purchase Criteria Dairy (PCD)	0.208	0.110	0.205
Personal Norm (PN)	0.235	0.126	0.542
Skepticism (SKM)	0.174	0.207	0.508
Social Norms (SN)	0.221	0.978	0.088
Trust (TRU)	0.836	**0.001**	0.102

Table 7.21 Compositional Invariance assessment – education level

The education level shows a large difference in sample sizes between the different groups, which makes the permutation approach questionable. The sample sizes of the three groups are: $p^{high\ level} = 197$; $p^{mid\ level} = 469$; *and* $p^{low\ level} = 123$. Due to the fact that the group sizes are very different, the PLS-MGA, Parametric test, and Welch Satterthwaite *t* test are applied to establish the configural and compositional invariance

To gain an understanding of whether the education level has a moderation effect on the intention to purchase dairy products from companies that are committed to CO_2 emission reduction, the high-level and low-level, the high-level and mid-level, and the mid-level and low-level education groups are compared (*see* Table 7.21).

The PLS-MGA represents a one-sided hypothesis test, meaning, that it is assumed, that $p^{(1)}$ is larger than $p^{(2)}$ (Hair et al., 2018). A p value < 0.05 shows that the first group has a significantly larger path coefficient than the second group. For testing the opposite direction a p-value > 0.95 indicates that the second group's path coefficient is significantly larger. Testing two-sided hypotheses is only possible with limitations as the bootstrap-based distribution is not necessarily symmetric (Hair et al., 2018). For this research, the focus is on the one-sided hypothesis test, because it is assumed, that a higher education level will have a larger effect on the different paths in the model than a lower education level.

Path Coefficients	PLS MGA		
	High vs. Low level	High vs. Mid level	Mid vs. low level
AR --> PN	0.605	0.428	0.733
AT --> IT	0.808	0.158	0.680
AC --> AR	0.595	0.648	0.169
AC --> PN	0.612	0.846	0.334
BC --> IT	0.465	0.310	0.044*
EBE --> AT	0.624	0.247	0.308
IMD --> AT	0.448	0.743	0.442
ODC --> AT	0.818	0.755	0.370
PCD --> AT	0.298	0.943	0.788
PN --> AT	0.746	0.429	0.656
PN --> IT	0.512	0.122	0.436
SCM --> AT	0.427	0.058	0.349
SN --> IT	0.556	0.838	0.565
*Significant effect	0.780	0.300	0.704

Significance level ($p <= 0.10$) for the difference in relationship
*Significant effect

Table 7.22 PLS-MGA analysis of education level

Table 7.21 shows that, apart from the relationship between BC and IT, no significant effect of different education levels on the path coefficients can be observed. For BC on IT, mid-level education indicates a larger effect than low education level. All other p values are >0.05 indicating that there is no significant difference in the path coefficients observed at least referring to the assumption, that a higher education level leads to a larger effect on the different paths. The relationship between BC and IT is part of the BRT, but for this research the analysis of the total effect shown in Table 7.13 shows that this relationship is not significant in the context of the research question. Therefore, it is concluded that education does not have a moderation effect in the context of the defined research model and research question. This means that education level does not have an effect on the behavioural intention to purchase dairy products produced by companies, which are committed to CO_2 emission reduction.

7.5   Summary data analysis

The main findings of the analysis are summarised and presented in this section. The results are summarised in Table 7.22. In the first section of this chapter (7.4.1), the measurement model

was assessed. After deleting a number of items with low factor loading, the model shows satisfactory outcomes for the indicators of reliability, composite reliability, convergent validity, and discriminant validity.

Summary Data Analysis			
Measurement Model - 7.4.1			
1	Indicator reliability	Content and face validity	Items with facor loading <0.4 removed 5 reason constructs kept in the model
2	Internal consistency reliability	Cronbach's Alpha >0.7 CR between 0.7 and 0.95	All constructs satisfactory with CR between 0.7 and 0.95 2 constructs with Cronbach's Alpha < 0.7
3	Convergent validity	AVE > 0.5	All constructs accepted
4	Discriminant validity	Cross loadings Fornell-Larcker criterion HTMT	Established for all constructs
Structural Model - 7.4.2			
1	Collinarity issues	VIF < 5	No collinarity among the predictor constructs
2	Significance and relevance of the structural model relationships	t values > 1.96	--> AR 1 significant --> PN 2 significant --> AT 4 of 7 not significant --> IT 1 of 4 not significant
3	Coefficient of determination	R^2	Evaluated as moderate for all 4 constructs
4	Effect size	f^2 and total effects	PN, AC, AR, AT and EBE and SCM show significant effects on IT
5	Predictive relevance	$Q^2 > 0$	Endogenous constructs AR, AT, PN, IT show predictive relevance
6	Effect size	$q^2 > 0$	
7	Model fit	SRMR < 0.10	With an SRMR = 0.055 the model fit is acceptable
Mediation and Moderation - 7.4.3			
1	NAM as mediator model	AC --> PN mediated by AR	AR partially mediates the relationship between AC and PN
2	Mediator AT	AT as mediator for PN --> IT	AT partially mediates the relationship between PN and IT
3	Moderation effect - Gender	Compositional, full measurement invariance, PLS-MGA	Moderation effect of gender not confirmed
4	Moderation effect - Education level	Compositional, full measurement invariance, PLS-MGA	Moderation effect of educational level not confirmed

Table 7.23 Summary data analysis results

In this chapter, the quality of measurement model has been evaluated by assessing its reliability and validity. After deleting a number of items with low factor loadings, the model shows satisfactory outcomes for the indicators of reliability, composite reliability, convergent validity, and discriminant validity. This is summarised in Table 7.22.

The structural model confirms that the model fit is acceptable. The endogenous constructs, AR, AT, PN, and AT, show predictive relevance and the constructs, PN, AC, AR, AT, EBE, and SCM, show significant effects on IT.

Regarding the mediation effect, the model for this research confirms that the NAM is a mediator model, in accordance with the literature. A further mediation effect within the defined research model is observed in the impact of PN on IT, which is partially mediated by AT.

The assumption that gender and education level will have an influence on the intention to purchase dairy products produced by companies that are committed to CO_2 emission reduction is not confirmed in this research model.

Chapter 8: Discussion and Conclusions

8.1   Introduction

This chapter examines the research findings and the contribution of this research in detail. This research sets out to strengthen the predictability of consumer behavioural intention with regards to buying dairy products produced under the consideration of CO_2 emission reduction. Objective 1 of this research is to develop a theoretically grounded conceptual framework to understand the self-interest and pro-social motives around consumer purchase decision making for dairy products. A review of the existing literature reveals a lack of research in the field of pro-environmental consumer decision making in the context of low-involvement products. Developing a new conceptual framework is deemed necessary for mainly two reasons: (1) the need of dairy companies to increase the visibility of and consumer consideration regarding their engagement in CO_2 emission reduction; *and* (2) to develop an approach to encourage consumers to consider CO_2 emission reduction carried out by dairy companies in their daily purchase decisions. Objective 2 considers the main factors that drive purchase decisions for dairy products produced under the consideration of CO_2 emission reduction.

This research aims to contribute to academic and managerial literature within the domain of consumer purchase decision behaviour, specifically in the context of low-involvement products.

The literature review of this thesis (Chapters 2 and 3) focuses on CO_2 emission reduction within the dairy industry and its integration into the CSR framework. CO_2 emission reduction has become one of the most discussed topics across most industries and many companies have implemented different activities to live up to the SDGs, supporting environmental requirements established by governments and society. The food industry, and especially the dairy industry, is a huge contributor to industrial CO_2 emissions, which emphasises the value of this study. Some manufacturers have set ambitious goals, e.g. "carbon net zero" by 2050. To attain these goals, companies are adopting a number of relevant measures, including approaching consumers as an important stakeholder group. In order to target and reach consumers, companies need to develop a clear understanding of consumer motivation to purchase pro-environmental products as a basis for a successful communication strategy.

The literature review in Chapter 3 reveals that multi-attribute attitude models, such as the Theory of Planned Behaviour and the Theory of Reasoned Action, are most commonly used to examine consumer purchase decisions in the ethical context. The Behavioural Reasoning Theory (Westaby, 2005) adds contextual specificity to the TPB/TRA factors of attitude, subjective norms, and behavioural control. It is suggested that the BRT explains the variance of the dependent variable better than other behavioural theories (Claudy et al., 2015). To increase the predictive power of the model further, this researcher has combined the BRT with the Norm Activation Model. The NAM focuses on the impact of personal norms on behavioural intention and is often used when researching pro-environmental consumer behaviour. Since this research aims to understand consumer motives to consider CO_2 emission reduction in the purchase decision process, the actual purchase behaviour is not included. The purchase intention is considered as a good indicator for purchase behaviour (Ajzen, 1991).

Even though pro-environmental purchase decisions, including consideration of CO_2 emission reduction, are defined as ethical or pro-social, previous studies on pro-environmental behaviour show inconclusive results. Depending on whether self-interest or moral obligation influenced consumers in their purchase decisions, attitude or personal norms, respectively, showed the highest predictive power with respect to behavioural intention. At the same time, the impact of subjective norms and behavioural control as part of the TPB/BRT has changed.

Another factor playing a role when dealing with consumer purchase decisions is whether the consumer is dealing with low or high involvement products. Most research on pro-environmental decision making centres around the environmental impact of high involvement products or services, such as electronic devices, transport, or hotel stays. Only a few studies have been conducted, which focus on low involvement products. Considering available studies regarding pro-environmental consumer decision making, it is difficult to solely focus on self-interest or pro-social motives in the context of consumer intention to purchase dairy products, which have been produced by companies that are committed to CO_2 emission reduction. As seen in research conducted by Harland et al. (1999), including moral obligation into the analysis increases the clarity of the attitudinal BRT framework. This suggests that the constructs in attitudinal frameworks do not fully capture the influence of moral considerations on intention to perform environmentally relevant behaviours. Consequently, for the purposes of this study, the researcher has included self-interest and pro-social motives into the research framework to

gain a clearer understanding of the impact of the different motives on pro-environmental purchase intention. The aim of this research is to empirically examine the role of attitude, social norms, behavioural control, and personal norms on the prediction of purchase intention in relation to dairy products produced under the consideration of CO_2 emission reduction.

A research gap has been identified concerning pro-environmental consumer decisions and low-involvement products. The objective of this study is to develop a deeper understanding of consumer consideration of environmental topics – in this case, CO_2 emission reduction - when opting for low involvement products, such as dairy products, as well as to examine which factors most influence ethical decision making.

The research question is centred around strengthening consumer contribution to company CO_2 emission reduction goals. A review of literature has revealed that the Theory of Planned Behaviour is the most commonly used theory when it comes to predicting consumer purchase intention. The theory is built on consumer behaviour, which is activated by intention and can be predicted by attitude, social norms, and behavioural control. With a view to contributing to existing research, this study considers two additional perspectives: (1) consideration of context specific "reasons for" and "reasons against" a given behaviour to explain and justify consumer decisions; *and* (2) integration of moral obligations in the form of personal norms, which are often used when examining pro-social behaviour. These two additional perspectives are found in the Behavioural Reasoning Theory and the Norm Activation Model. Both theories have been used in the pro-environmental and pro-social context. However, to the best of the researcher's knowledge, they have not been combined in the context of research on low involvement product purchase decisions. By combining the two, this research model sets out to improve the prediction of behavioural intention and define the most important antecedents from different theories.

8.2   Discussion of the empirical research findings

Due to the dearth of research on the importance of CO_2 emission reduction in the production process of low involvement products, this study aims to provide a comprehensive understanding of consumer intention to consider products produced under consideration of CO_2 emission reduction by integrating the Behavioural Reasoning Theory (Westaby, 2005) and the Norm

Activation Model (Schwartz, 1977). The study reveals that both self-interest motives and pro-social motives play significant roles in consumer intention to purchase dairy products, where CO_2 emission reduction has been considered in the production process. These findings are consistent with previous studies (Shin, 2018; Han et al, 2015, Han et al., 2017; Park and Ha, 2015). Overall, however, moral norms exert a greater influence on purchase intention.

A summary of the research hypothesis can be found in Table 8.1. The results of the hypothesis test will be discussed in detail in this section.

Theory	Hypothesis	Description of the hypothesis	Test result	Conclusion
Behavioural Reasoning Theory	H1	Consumer attitude is positively related to intention to choose dairy products produced by companies which are committed to CO2 emission reduction.	β=.285, t=9.015 p < .001	supported
	H2	Subjective norms are positively related to the intention to choose dairy products from companies which are committed to CO2 emission reduction.	β=.054, t=1.872 p=.061	not supported
	H3	Perceived behavioural control is positively linked to intention to choose dairy products produced by a company which is committed to CO2 emission reduction.	β=.082, t=3.406, p<.001	supported
	H4.1	"Environmental benefit" as a reason for buying dairy products from manufacturers reducing their CO2 emissions will positively influence consumer attitude towards the purchase.	β=.184, t=4.773, p<.001	supported
	H4.2	"Trust" as a reason for buying dairy products from manufacturers reducing their CO2 emissions will positively influence consumer attitude towards the purchase.	β=-.051, t=1.412, p=.158	not supported
	H5.1	"Scepticism" as a reason against buying dairy products from manufacturers reducing their CO2 emissions will negatively influence consumer attitude towards the purchase.	β=-.176, t=4.842, p<.001	supported
	H5.2	"Image of Dairy" as a reason against buying dairy products from manufacturers reducing their CO2 emissions will negatively influence consumer attitude towards the purchase.	β=-.020, t=0.679, p=497	not supported
	H5.3	"Other Decision Criteria" as "reasons against" buying dairy products from manufacturers reducing their CO2 emissions will negatively influence consumer attitude towards the purchase.	β=.016 t=0.510, p=.610	not supported
	H5.4	Purchase Criteria for Dairy" as "reasons against" buying dairy products from manufacturers reducing their CO2 emissions will negatively influence consumer attitude towards the purchase.	β=-.006, t=.162, p=.871	not supported
Norm Activation Model	H6	Awareness of consequences of environmentally friendly production is positively related to the ascription of responsibility.	β=.537, t=16.309, p<.001	supported
	H7	Awareness of consequences of environmentally friendly production is positively related to the consumers purchase intention.	β=.510, t=13.429, p<.001	supported
	H8	Ascription of responsibility is positively related to personal norms.	β=.706, t=32.200, p<.001	supported
	H9	Personal Norms are positively related to the attitude to choose dairy products from manufacturers reducing CO2 emissions in the production process.	β=.410, t=10.572, p<.001	supported
	H10	Personal Norms are positively related to the intention to choose dairy products from manufacturers reducing CO2 emissions in the production process.	β=.413, t=10.798, p<.001	supported
Moderator effect	H11	Gender moderates relations in the research model with an effect on the consumers' purchase intention for dairy products produced by manufacturers committed to CO2 emission reduction.		not supported
	H12	Consumers' education level moderates relations in the research model with an effect on the consumers' purchase intention for dairy products produced by manufacturers committed to CO2 emission reduction.		not supported

Table 8.1 Summary of the research hypotheses

As expected in H1, H3, H10, the study findings indicate that attitude, behavioural control, and personal norms are determinants of purchase intention, which is in line with previous research on pro-environmental behaviour (Han et al., 2017; Park and Ha, 2014). The results provide empirical support for the advantages of combining the two theories – BRT and NAM – indicating that attitude, behavioural control, and personal norms have a significant positive impact on behavioural intention. The findings are consistent with previous research, which also combined theories with complementary motivations, e.g. self-interest and moral motivations, and show that this research enhances the understanding of pro-environmental behaviour (e.g.

Bamberg and Möser, 2007; Harland et al., 1999; Shin et al., 2018; Park and Ha, 2014; Han 2015).

Looking at the relative importance of the different constructs, personal norms have the most significant impact on consumer purchase intention to buy dairy products produced under consideration of CO_2 emission reduction. This result is consistent with Thøgersen's (2009) findings, which indicate that environmentally friendly purchase behaviour is strongly based on moral reasoning.

As hypothesised in H6, H7 and H8, personal norms are affected by awareness of consequences and ascription of responsibility, both exerting a similar effect. Several studies have discussed whether awareness of consequences is fully or partly mediated by ascription of responsibility. Schwartz and Howard (1981) favour the fully mediated approach in the original NAM. This study provides empirical evidence for partial mediation of the relationship between awareness of consequences and personal norms, as hypothesized in H6 and in line with Stern et al. (1999) and Stern (2000). This study also shows that awareness of consequences has a strong impact on ascription of responsibility. Thus, consumer's moral norms can be activated directly through recognition of negative consequences and through a feeling of responsibility for these negative consequences.

Attitude is affected by environmental benefits and scepticism (H4.1 and H5.1), as well as by personal norms. Environmental benefits act as a reason for choosing a dairy product produced under the consideration of CO_2 emission reduction, whereas scepticism has a significant negative effect on attitude. The other reasons for (H.4.2) and against (H5.2, H5.3, H5.4) a given decision did not have a significant effect and the hypotheses are not supported by the empirical evidence. Furthermore, PN explains a part of AT (H7) and AT partially mediates the relationship between PN and IT. Attitude represents a complimentary mediation of the relationship from PN to IT, both the direct and indirect effect are positive. In other words, moral obligations add to the non-internalised motivations of AT and affect IT. It can be argued that these results support Harland et al.'s (1999) findings that adding personal norms into the equation improves the clarity of the approach, meaning that AT focuses on non-internalised motivations, whereas PN includes moral obligations.

Examining the two constructs in more detail, discriminant validity is established, meaning that the constructs are distinct from each other and PN does not substitute attitude. This is in line with Manstead (2000) who points out that moral norms reflect an individual's feeling about whether a behaviour is inherently right or wrong, whereas the usage of semantic differential attitude scales, as used in this research, reflect overall positive or negative evaluations towards the behaviour. In other words, semantic differentials show pay offs rather than inherent rightness or wrongness (Manstead, 2000). The only semantic differential which may show an overlap with moral concern is the "good and bad" differential, which represents only one of seven differentials used in this research. These findings lead to the conclusion that, aside from reasons for/against, PN strengthens the prediction of attitude.

In order to strengthen consumer attitude, it is important to increase consumer focus on the benefits of CO_2 emission reduction and to reduce their scepticism towards the industry and the industry's commitment towards CO_2 emission reduction. Furthermore, it is important for consumers to recognise the opportunity they have to contribute to CO_2 emission reduction when purchasing dairy products, produced by companies who implement CO_2 emission reduction practices.

8.2.1 Behavioural Reasoning Theory

In the following section the different hypotheses and main findings connected to the BRT are discussed in detail. An overview of the hypotheses based on the BRT is shown in Table 8.2.

Theory	Hypothesis	Description of the hypothesis	Test result	Conclusion
Behavioural Reasoning Theory	H1	Consumer attitude is positively related to intention to choose dairy products produced by companies which are committed to CO2 emission reduction.	β=.285, t=9.015 p < .001	supported
	H2	Subjective norms are positively related to the intention to choose dairy products from companies which are committed to CO2 emission reduction.	β=.054, t=1.872 p=.061	not supported
	H3	Perceived behavioural control is positively linked to intention to choose dairy products produced by a company which is committed to CO2 emission reduction.	β=.082, t=3.406, p<.001	supported
	H4.1	"Environmental benefit" as a reason for buying dairy products from manufacturers reducing their CO2 emissions will positively influence consumer attitude towards the purchase.	β=.184, t=4.773, p<.001	supported
	H4.2	"Trust" as a reason for buying dairy products from manufacturers reducing their CO2 emissions will positively influence consumer attitude towards the purchase.	β=-.051, t=1.412, p=.158	not supported
	H5.1	"Scepticism" as a reason against buying dairy products from manufacturers reducing their CO2 emissions will negatively influence consumer attitude towards the purchase.	β=-.176, t=4.842, p<.001	supported
	H5.2	"Image of Dairy" as a reason against buying dairy products from manufacturers reducing their CO2 emissions will negatively influence consumer attitude towards the purchase.	β=-.020, t=0.679, p=497	not supported
	H5.3	"Other Decision Criteria" as "reasons against" buying dairy products from manufacturers reducing their CO2 emissions will negatively influence consumer attitude towards the purchase.	β=.016 t=0.510, p=.610	not supported
	H5.4	Purchase Criteria for Dairy" as "reasons against" buying dairy products from manufacturers reducing their CO2 emissions will negatively influence consumer attitude towards the purchase.	β=-.006, t=.162, p=.871	not supported

Table 8.2 Hypotheses Behavioural Reasoning Theory

8.2.1.1 Attitude, Subjective Norms and Behavioural Control

H1: Consumer attitude is positively related to intention to choose dairy products produced by companies committed to CO$_2$ emission reduction.

H1 looks at the positive effect of AT on IT. A positive impact on IT was found (β =.285, t=9.015, p<.001). Hence, H1 is supported.

This hypothesis is supported. However, attitude is not the strongest contributor to the purchase intention to buy dairy products produced by manufacturers commitment to CO$_2$ emission reduction as indicated in other studies dealing with ethical purchase decisions. Shin et al. (2018) discovered that purchase intention for organic food is mostly motivated by self-interest, as organic food products are perceived to be healthier by the individual. Furthermore, consumers consider health to be one of the most important aspects when choosing organic food, according to studies *(e.g.,* Rana and Paul, 2017). This helps to explain why self-interest is important in this specific situation. Researching on the intention to stay at a green hotel, Verma and Chandra's (2018) found, that attitude ranked highest even after moral reflectiveness and consciousness were introduced to the model. They argue that the moral reflectiveness allows consumers to adjust to what is considered as correct or incorrect in a specific situation, whereas conscientiousness is a key factor in attitude formation. This could lead to consumers picking a non-green hotel despite pro-environmental behaviour.

In contrast, the findings of a study on CO$_2$ emission reduction in the dairy business reveal that customers' self-interest is diminished when it comes to CO$_2$ emissions, and moral standards have the biggest impact on intention formation. This effect can be explained by considering CO2 emission reduction as a decision based on social and altruistic considerations.

This research confirms the result of the studies conducted by Yadav and Pathak (2016). When dealing with green products, it can be argued that the consumers connect "green" to the production process, putting environment and altruistic motives in focus. Organic food products need to be differentiated from green consumer products because the purchase decision associated with the former is mainly driven by health, a self-interest motive (Shin et al., 2018).

This finding suggests that theories based on self-interest and rational decision making, such as the TPB and the BRT, only explain a small part of intention building for low involvement

products, where the environmental impact of the production process is considered. The lower contribution of attitude to behavioural intention can be explained through the integration of moral obligations, environmental concerns, and knowledge. In this study, personal norms describe the moral obligation of consumers to consider the environment and act ethically. The strong influence of personal norms means that internalised moral considerations highly influence the cognitive and affective evaluation of consumers when deciding to purchase dairy products produced with a commitment to CO2 emission reduction. In accordance with the self-determination theory (Ray and Decy, 2003), motivations that are more internalised, e.g. personal norms, are becoming more stable and predictive. This will reduce the predictive power of more self-interested motives, represented by attitude in this context.

H2: Subjective norms are positively related to intention to choose dairy products from companies committed to CO_2 emission reduction.

H2 evaluates the positive effect of SN on IT. The results show a significant impact on IT (β=.054, t=1.872 p=.061). Hence, H2 is not supported.

This hypothesis is not supported. Subjective norms do not show a significant impact on purchase intention, which means that peer influence and social recognition does not play a role in the context of this study. This finding suggests that the opinion of others does not matter in the context of choosing dairy products which are produced with a commitment to CO_2 emission reduction. This contradicts the results of former studies.

Most studies dealing with the pro-environmental consumer decision making support the importance of subjective norms (e.g., Park and Han, 2014), while highlighting that the strength of their impact varies depending on the context. Thøgersen (2009) found a significant positive relationship between social norms and purchase intention with respect to organic food. Shin et al. (2018) showed that social norms and personal norms have a similar impact in the context of pro-environmental behaviour with respect to organic dining. Yadav and Pathak (2016) also confirmed that subjective norms play an important role in the context of green product purchase intention. On one hand, Onel (2017) indicates that adding personal norms to the research model adds to the prediction of pro-environmental purchase intention and behaviour but does not

reduce the impact of subjective norms. On the other, a study conducted by Bertoldo and Castro (2016) showed that adding personal norms to the research model in the context of pro-environmental behaviour changes the predictive power of social norms. They argue that their results are consistent with the proposition of the Value-Belief-Norm Theory (Stern et al., 1999; Stern, 2000), which states that personal norms are the best predictor of behaviour when compared to the more external – descriptive and injunctive - social norms (Stern et al., 1999; Stern, 2000). Prior studies confirm the importance of subjective norms in pro-environmental decision making. However, Sia and Jose (2019) found, when researching eco-friendly houses, that the relationship between social norms and purchase intention is fully mediated by personal norms. They argued that this finding is in line with past research, stating that the purchase intention associated with building an eco-friendly house is not predicted by the approval or disapproval of relevant groups; internalised social norms predict the purchase intention (Ru et al., 2019; Chen and Tung, 2014).

Based on the results of this study, this researcher argues that, due to acceptance of climate change as a reality (Galgano, 2019; Oreskes, 2004; Parry et al., 2008) and ongoing discussions around many different pro-environmental aspects of everyday life (*e.g.* recycling, energy saving, waste separation) which have a clear impact on climate change, food production forms part of these discussions. On the one hand, this can lead to the observed strong influence of internalised moral obligations, which reduces the impact of subjective norms (Stern et al., 1999; Stern. 2000). On the other, this can result in internalised subjective norms, which do not have a direct effect on intention.

H3: Perceived behavioural control is positively linked to intention to choose dairy products produced by a company committed to CO_2 emission reduction.

H3 evaluates the positive effect of BC on IT. A significant impact of BC on IT was established (β=.082, t=3.406, p<.001). Hence, H3 is supported.

In line with existing literature, the findings show that perceived behavioural control is positively linked to intention. This indicates the presence of obstacles in the ethical decision making process. In this study, attitude is considered to be the strongest factor influencing purchase

intention, whereas perceived behavioural control has a marginal effect, and subjective norms have been found to have no impact. Following existing theory, Ajzen (1991) notes that the relative importance of attitude, subjective norms, and perceived behavioural control in the prediction of intention is expected to vary across behaviours and situations. With attitude having been found to be the strongest predictor of all the variables in the BRT, the result is in line with Ajzen's (2015) findings. Furthermore, existing literature suggests a strong positive relationship between perceived behavioural control and purchase intention (Vermeir and Verbeke, 2008). In the context of pro-environmental behaviour, perceived behavioural control is seen as one of the most important determinates of behavioural intention (Ru et al., 2018; Chen and Tung, 2014; Park and Ha, 2014).

The study results show a noteworthy relationship between the two variables, but the relationship is not very strong. The relationship can be explained by current market conditions, where consumers expect easy access to dairy products and products produced under consideration of CO_2 emission reduction, if these are offered on the market. This researcher contends that consumers expect that, with the growing focus on CO_2 emission reduction (*e.g.* "carbon net zero" communication), more and more companies are adhering to global climate goals, including CO_2 emission reduction, as part of their production process. Therefore, they expect that market availability of products produced in an environmentally friendly way will increase.

However, the marginal effect of behavioural control indicates that consumers lack full confidence in their own capabilities to buy environmentally friendly dairy products. It also shows that they do not perceive themselves as having the complete control over the action. This could be caused by missing knowledge and information about the availability of these products on the market, which makes it difficult for consumers to know what to expect. This notion is supported by the fact that CO_2 emission reduction in the food industry, especially in the dairy industry, is not communicated frequently. As a result, consumers feel unsure about whether it will be possible for them to find dairy products, which have been produced with a commitment of CO_2 emission reduction. This perceived insecurity may have had an influence on attitude and purchase intention in this study.

8.2.2 Behavioural Reasoning Theory: "Reasons for" and "Reasons against"

In accordance with the Behavioural Reasoning Theory (Westaby, 2005), the reasons for a given behaviour in this study have been structured in second order factor constructs to show the expected differences in the impact of specific reasons on attitude and purchase intention in the consumer decision making process. The different reason constructs will be discussed in this section and will be structured in terms of "reasons for" and "reasons against".

"Reasons for": H4.1 and H4.2

Reasons for are defined by two different reason constructs, environmental benefits (EBE) and trust (TRU). "Environmental benefits" include the effect of each purchase on CO_2 emission reduction, increased industry involvement and product availability caused by higher consumer interest, and positive effects for local surroundings and future generations. "Trust" describes the confidence of consumers in their contribution to CO_2 emission reduction when dedicating time to product selection and when buying selected and known brands, organic and local products, and certified products.

H4.1: "Environmental benefits" as reasons for buying dairy products from manufacturers reducing CO_2 emissions will positively influence attitude towards the purchase.

H4.1evaluates whether EBE has a significant positive impact on AT. The results revealed that EBE has a significant impact on AT (β =.184, t=4.773, p<.001). Hence, H4.1 is supported.

Earlier studies using the BRT confirm that environmental and personal benefits as 'reasons for' are positively associated with attitude and intention (Claudy et al., 2015; Westaby et a., 2010, Tandon et al., 2020), trigger positive attitude, and engage in related actions. Hartmann and Apaolaza (2012) found that environmental utilitarian benefits, such as reduced emissions due to the use of renewable energy sources, show a significant influence on purchase intention, partially mediated by attitude. Zhang et al. (2018) found in his study, that environmental benefits can explain and predict attitude and purchase intention of electric vehicles and can also sustain electric vehicle adoption.

In this research the environmental benefits associated with CO_2 emission reduction and the impact of this on future generations and local surrounding defined as "reasons for" is the only reason construct that shows a significant positive effect on attitude.

The influence of environmental benefits on purchase intention can be explained through media attention on CO_2 emission reduction and the associated environment impacts over recent years. The results of this study reveal that CO_2 emission reduction in the dairy industry activates altruistic reasons, including environmental and other social benefits. Consequently, it can be argued that environmental benefits as "reason for" with its pro-social and altruistic character are strengthening consumers' attitude. These findings are in line with previous research named above.

H4.2: "Trust" as a reason for buying dairy products from manufacturers reducing their CO_2 emissions will positively influence attitude towards the purchase.

H4.2 evaluates whether TRU has a significant positive impact on AT. The results revealed that TRU has no significant impact on AT ($\beta=.051$, $t=1.412$, $p=.158$). Hence, H4.2 is not supported.

In general, when consumers buy selected brands, or local, bio or certified products they trust that these products support the goal of CO_2 emission reduction. However, this trust does not have a significant effect on attitude. It seems that consumers assume that CO_2 emission reduction is part of the industry's production process. The study findings suggest that trust in a dairy company's CO_2 emission reduction strategy does not motivate consumers to have a favourable attitude towards CO_2 emission reduction in the production process. Therefore, this researcher argues that consumers need more specific information about the environmental benefits of the product they are buying, as opposed to general trust in the company and its consideration of CO_2 emission reduction. Trust can be considered a precondition for more clearly defined communication of environmental benefits, which support a positive attitude.

Based on these findings, it can be concluded that it is more important to focus on information regarding the environmental benefits of CO_2 emission reduction, which is clearly linked to the dairy industry, than to strengthen consumer brand and certification trust.

"Reasons against": H5.1 – H5.4

Four different "reasons against" constructs have been tested and will be discussed in the following section. "Scepticism" includes uncertainty about the effect of an individual purchase. It also includes scepticism around information regarding CO_2 emission reduction of dairy companies, as well as the likelihood that companies will live up to their CO_2 emission reduction commitments throughout the whole value chain. "Image of Dairy" is only built on two factors: (1) missing information regarding dairy industry CO_2 emission reduction; *and* (2) focus on other criteria when deciding to opt for dairy products. "Purchase criteria for dairy" include criteria, which are considered negative, e.g. dairy products are not as environmentally friendly as plant-based products, animal welfare is considered more important, or the fact that consumers do not spend much time on their purchase decision for dairy products, which leaves little room to consider CO_2 emission reduction. The last category, "other decision criteria", focuses on the relevance of price, organic production, and the need for consumers to build an opinion based on their own research before choosing dairy products produced under consideration of CO_2 emission reduction.

In the following section, the hypotheses will be discussed in detail:

H5.1: "Scepticism" as a reason against buying dairy products from manufacturers reducing their CO_2 emissions will negatively influence attitude towards the purchase.

H5.1 evaluates whether SCM has a significant negative effect on AT. The results showed a significant negative impact on AT ($\beta=-.176$, t=4.842, p<.001). Hence, H5.1 is supported.

Scepticism is the only reason against which has a significant negative effect on attitude. Scepticism has been found to be one of the main "reasons against" in several studies and contexts. Examples include Harris et al. (2015) who found that a complex supply chain in the clothing industry makes it difficult to believe claims about ethical practice. Ryan and Casidy (2018) showed the significant effect of scepticism on attitude in their study on organic food. The scepticism in their study was driven by doubt regarding the legitimacy of certification and a lack of understanding of the effects of organic food.

This research on CO_2 emission reduction in the dairy industry supports earlier findings and suggests that the lack of consumer information about CO_2 emission reduction in the dairy

industry in general and of different brands in particular, as well as doubts about the impact of personal purchase behaviour, are driving "scepticism". This indication is supported by Wigley (2008), who found that knowledge about CSR activities is a strong predictor of consumer behaviour, but it is often difficult to retrieve and store the relevant information. Earlier studies have suggested that consumer awareness of company CSR activities have been low (*e.g.* Pomering and Dolincar. 2008; Hartmann et al., 2013)) and a low awareness does not activate the consideration of CSR characteristics in the purchasing decision process. This is a limiting factor with respect to positive consumer response to CSR activities (Mohr et al., 2001). This low awareness of CO_2 emission reduction of dairy companies can be discussed in connection with the increasing awareness of environmental benefits. The fact that consumers are increasingly aware of environmental benefits are expected have an effect on consumers in the way that they are becoming more critical when evaluating companies' environmental sustainable practices (Nguyen et al., 2019) and require more information before they are ready to buy "green" products. The awareness of environmental benefits in general and the lack of consumer information about the CO_2 emission reduction in the dairy industry in particular is considered to enhance the critical evaluation of the pro-environmental approach of the dairy industry and at the same time is expected to enhance the scepticism of the consumers.

The fear of greenwashing is as well expected to strengthen the scepticism. Initiatives like "Together for Carbon Labelling" initiated by the food industry in Germany and environmental NGOs – German Zero and Global Impact Alliance – are discussed in the media. Among the private companies are Oatly and Nestlé who need some positive PR due to their investment in the company Blackstone known for their environmental and human rights violation (Fairplanet, 2021). Therewith the labelling activity of the industry can easily be seen as a new instance of greenwashing and greenwashing negatively influences green trust and often results in suspicion and scepticism about green claims. Research indicates that greenwashing has an effect on green purchase intention and that this mechanism is activated through green scepticism (Parguel et al., 2011). To conclude, this research reveals that scepticism is a significant "reason against" purchasing dairy products from companies committed to reducing CO2 emissions, and that dairy companies must pay close attention to this factor. A balanced approach that takes into account industry information, consumer interest and understanding about the environment, and the avoidance of "greenwashing" makes this a real challenge for businesses.

The other "reasons against" do not show significant effects on attitude and will not be discussed in detail. In general, it can be argued that the strong impact of moral obligations in the context of CO_2 emission reduction has shifted focus away from more rational "reasons for"/"reasons against", which do not directly relate to CO_2 emission reduction. Only reasons clearly linked to the environment and to CO_2 emissions in the industry seem to play a role in consumer purchase decisions for dairy products, including environmental benefits as a "reason for" and scepticism related to CO_2 emission reduction as a "reason against".

H5.2: "Image of Dairy" as a reason against buying dairy products from manufacturers reducing their CO_2 emissions will negatively influence attitude towards the purchase.

H5.2 evaluates whether IMD has a significant negative effect on AT. The results showed no significant negative impact on AT (β =-.020, t=0.679, p=.497). Hence, H5.2 is not supported.

It is concluded that "Image of Dairy" will not be considered nor discussed further. Only 2 items describe the construct, and the factor loadings were very low. Other items have also been deleted because of an even lower impact on the construct.

H5.3: "Other decision criteria" as "reasons against" buying dairy products from manufacturers reducing their CO_2 emission will negatively influence attitude towards the purchase.

H5.3 evaluates whether ODC has a significant negative effect on AT. The results showed no significant negative impact on AT (β =.016, t=0.510, p=.610). Hence, H5.3 is not supported.

 "Other decision criteria" did not show a negative effect on attitude and will not be discussed further.

H5.4: "Purchase criteria dairy" as "reasons against" buying dairy products from manufacturers reducing their CO_2 emission will negatively influence attitude towards the purchase.

H5.4 evaluates whether PCD has a significant negative effect on AT. The results showed no significant negative impact on AT (β =.006, t=0.162, p=.871). Hence, H5.4 is not supported.

"Purchase criteria dairy" did not show a negative effect on attitude and will not be discussed further.

8.2.3 Norm Activation Model

The NAM focuses on four different constructs: personal norms, awareness of consequences, ascription of responsibility, and purchase intention. The effect of PN on AT will also be evaluated. The hypotheses used for the NAM are shown in Table 8.3.

Theory	Hypothesis	Description of the hypothesis	Test result	Conclusion
Norm Activation Model	H6	Awareness of consequences of environmentally friendly production is positively related to the ascription of responsibility.	β=.537, t=16.309, p<.001	supported
	H7	Awareness of consequences of environmentally friendly production is positively related to the consumers purchase intention.	β=.510, t=13.429, p<.001	supported
	H8	Ascription of responsibility is positively related to personal norms.	β=.706, t=32.200, p<.001	supported
	H9	Personal Norms are positively related to the attitude to choose dairy products from manufacturers reducing CO2 emissions in the production process.	β=.410, t=10.572, p<.001	supported
	H10	Personal Norms are positively related to the intention to choose dairy products from manufacturers reducing CO2 emissions in the production process.	β=.413, t=10.798, p<.001	supported

Table 8.3 Hypotheses related to the Norm Activation Model

H6: Personal norms will positively influence consumer intention to purchase dairy products from manufacturers reducing their CO_2 emissions in the production process.

H6 assumes a positive effect of PN on IT, which was confirmed by a positive effect on IT (β =.537, t=16,309, p<.001). Hence, H6 is supported.

Personal norms have the highest impact on purchase intention for dairy products produced by a company committed to CO_2 emission reduction.

Several studies have been conducted using the Norm Activation Model (NAM) in the context of pro-environmental behaviour, which support the contribution of personal norms to the prediction of consumer purchase intention (e.g. Onwezen, 2013; De Grot and Steg, 2009; Wang et al., 2019; Zhang et al., 2013; Thøgersen and Ölander, 2006). Some studies in the pro-environmental context have – like this research – combined a self-interest and rational theory, such as the Theory of Planned Behaviour (Ajzen, 1991) or the Behavioural Reasoning Theory

(Westaby, 2005), with the Norm Activation Model (Schwartz, 1977). Depending on the study context the salience of each motive was found to be different.

Some studies, including Park et al. (2014), confirmed that personal norms contribute to behavioural intention in the context of recycling, although they were not found to be the strongest contributor. Shin et al. (2018) suggest that self-interest motives have a higher impact on purchase intention than pro-social motives in the context of choosing organic menu items when dining out. Han et al. (2017) focused on self-interest motives in a study about bicycle tourism. In research on green hotel visits, personal norms were found to be the most important factor (Han et al., 2015).

This research clearly indicates that personal norms are the strongest indicator in relation to consumer purchase intention around dairy products, which are produced by companies committed to CO_2 emission reduction. This confirms former research findings in the pro-environmental context (i.e. Han et al., 2015; Han et al., 2014; Zhang et al., 2013; Klöckner, 2014). The strong focus on personal norms indicates that motivation to act on CO_2 emission reduction criteria is internalised. The findings imply that ethical obligation to support the CO_2 emission reduction of dairy companies is essential in the context of pro-environmental purchase intention. It is, therefore, the most important driver, which companies must consider in order to enhance consumer consideration of their CO_2 emission reduction.

It is likely that pro-environmental discussions in the media, in politics and in society, alongside a favourable political climate in relation to CO_2 emission reduction in Germany (Engels, 2013), will encourage consumers to include general environmental concerns and CO_2 emission reduction considerations in their purchase decision making process.

In this study, CO_2 emission reduction is clearly associated with altruistic motives for supporting the environment, future generations, and local surroundings. Internalised motivations reduce the cognitive and affective impact on intention building, as expressed by the study results. Attitude and perceived behavioural control have a significant, but relatively-speaking smaller impact, and subjective norms have an insignificant effect on consumer purchase intention in this context..

Therefore, the researcher contends that communicating CO_2 emission reduction using a clear altruistic focus can activate personal moral obligations and strengthen the consumer purchase intention in the context of dairy products.

H7: Personal norms are positively related to attitude to choose dairy products from manufacturers reducing their CO_2 emissions in the production process.

The H7 hypothesis predicts a positive effect of PN on AT. The results showed a significant positive effect on AT (β=.510, t=13.429, p<.001). Hence, H7 is supported.

The model shows a strong impact of personal norms on attitude, supporting the hypothesis that PN is a predictor for AT. This also has an indirect effect on IT, meaning that AT mediates the relationship between PN and IT.

Based on these findings, it is argued that in the context of CO_2 emission reduction and purchase decisions for dairy products pro-social motives have a strong effect on AT. AT is defined as favourable or unfavourable cognitive evaluations, emotional experience, or behavioural tendencies of certain actions or situations (Blackwell et al., 2006). Whereas PN are defined as an individual's feelings of "moral obligation to perform or refrain from specific actions" (Schwartz and Horward, 1981, p.191). This research shows that activated moral obligations represented by PN affect cognitive evaluation and trigger the purchase intention.

This means that moral-obligation-centred communication aimed at strengthening consumer intention to purchase dairy products, which are produced under a commitment to CO_2 emission reduction, will have a two-fold effect on consumer purchase intention, namely, a direct effect and an effect mediated by attitude. This means that the effect of attitude on intention is partly determined by moral obligations. Communication which clearly focuses on personal norms and the activators of personal norms will influence consumer purchase intention directly and indirectly.

In accordance with the findings of this research, companies should focus their communication on PN in order to improve consumer purchase intention as PN was shown to have the most significant effect on purchase intention. This research also clearly indicates that integrating the two theoretical models – BRT and NAM – improves the predictability of and both models have constructs which affect consumer purchase intention .

Hypotheses H8 – H10 AC, AR and PN relationship

H8: Awareness of consequences of environmentally friendly production is positively related to ascription of responsibility.

H8 considers a positive effect of AC on AR. The results confirmed a significant effect of AC on AR (β =.706, t=32.200, p<.001). Hence, H8 is supported.

H9: Awareness of consequences of environmentally friendly production is positively related to consumer purchase intention.

H9 evaluates a positive effect of AC on PN, which was confirmed by the results and was indicated as significant (β=.410, t=10.572, p<.001). Hence, H9 is supported.

H10: Ascription of responsibility is positively related to personal norms.

H10 evaluates a positive effect of AR on PN, which was confirmed by the results and was indicated as significant (β=.413, t=10.798, p<.001). Hence, H10 is supported.

The research findings indicate that purchase intention to buy dairy products produced under the consideration of CO_2 emission reduction is driven mainly by personal norms. According to the Norm Activation Model, personal norms are strengthened by awareness of consequences and ascription of responsibility (Schwartz and Howard, 1981). This shows that a pre-condition for pro-environmental behaviour is that people care about environmental topics (Scannel and Gifford, 2013). In the context of this study, the strong effect of altruistic motivations presented by personal norms is driven by awareness of consequences and ascription or responsibility. When people ascribe responsibility, it can be argued that they do not only care about CO_2 emission reduction, but they also see it as their own responsibility to act on it; this satisfies the preconditions for pro-environmental behaviour.

Consistent with prior studies on pro-environmental consumer behaviour (De Groot and Steg, 2009; Onwezen et al., 2013, Zhang et al., 2018), this study confirms that awareness of consequences has a significant positive relationship to ascription of responsibility and both are significantly and positively related with personal norms. Consequently, this study has

demonstrated that the effect of awareness of consequences on personal norms is partially mediated by ascription of responsibility. Both awareness of consequences and ascription of responsibility show a direct effect on personal norms. This result is supported by prior research in the pro-environmental context (Stern et al., 1999; Stern, 2000; Steg and de Groot, 2010).

These findings indicate that consumers recognise the negative consequences of CO_2 emissions, in general. It also shows that they relate this knowledge to their purchase decisions related to low involvement products, such as dairy. In this study, awareness of consequences strongly influences personal norms, which is caused, on the one hand, by a direct effect on moral obligations, and, on the other hand, by activating the personal feeling of responsibility for the consequences. Both lead to the high predictive power of personal norms in relation to consumer purchase intention, as discussed under Hypothesis 6.

This finding leads to the question of whether awareness of the consequences of CO_2 emissions is built on general knowledge or whether it is clearly connected to industry, in this case the dairy industry. Answering this question would provide highly relevant information for the dairy industry and for future research.

8.2.2 Final remarks on the integration of the BRT and the NAM

Combining the BRT and the NAM increases the explained variance in the purchase intention. This result indicates that the BRT constructs, on the one hand, do not entirely capture the moral obligations related to purchase intention in the context of environmentally relevant behaviours. On the other hand, the low contribution of the BRT constructs – AT, SN, and BC – to behavioural intention when PN is integrated can be explained by a clear differentiation between internalised and non-internalised norms. This means that, when setting a control for the personal normative influence by integrating PN to the BRT, the BRT constructs AT, SN, and BC represent non-moral costs and benefits and non-internalised norms; whereas PN stands for internalised moral norms. It can be argued that integrating the two models improves research clarity by clearly differentiating between moral and non-moral considerations in the context of environmental friendly purchase decisions related to low-involvement products, such as dairy.

8.2.4 Moderation Analysis

Two moderation effects have been assessed in this research – gender/sex and education level (*see* Table 8.4).

Theory	Hypothesis	Description of the hypothesis	Conclusion
Moderator effect	**H11**	Gender moderates relations in the research model with an effect on the consumers' purchase intention for dairy products produced by manufacturers committed to CO2 emission reduction.	not supported
	H12	Consumers' education level moderates relations in the research model with an effect on the consumers' purchase intention for dairy products produced by manufacturers committed to CO2 emission reduction.	not supported

Table 8.4 Hypotheses moderation effect of gender and education

H11: Gender moderates relations in the research model with an effect on the consumers' purchase intention for dairy products produced by manufacturers committed to CO2 emission reduction.

No moderation effect of gender was found in this study. This finding contributes to inconclusive findings in existing literature.

Looking at earlier studies, two different perspectives have been documented: (1) a higher degree of female attitudes, concerns and activity levels when it comes to pro-social behaviour (*i.e.* Mainieri, 1997; Zelenzy, 2000; Stern et al., 2005; Luchs and Mooradin, 2012; Scannel and Gifford, 2003; Liu e al., 2020); and (2) no difference observed (*i.e.* Vicente-Molina, 2017; Sharma and Foropon, 2019). The majority of extant research shows that women tend to have a greater interest in and commitment towards climate change issues than men. This higher level of interest in and commitment towards pro-social behaviour shown by females is often explained by the socialisation of females to value the needs of others, which is often evident in a stronger ethic of care, and more helpful and altruistic behaviour (Stern et al., 2005).

One main argument deals with knowledge and concern around climate change. In most studies, women express slightly greater concern about climate change than men (Zelezny et al. 2000). Other studies argue that the higher scientific knowledge of men has an inverse effect on environmental concern and can level the stronger interest of women (McCright, 2010). McCright (2010) found in contrast to prior research that women exhibit higher level of scientific climate change knowledge and concern, but woman as well underestimate their climate change knowledge and show lesser understanding of global warming.

In addition to the gender socialisation perspective, studies have examined on the social role perspective, which supports that societal roles, such as employment status, homemaker status, and parenthood (Blocker and Eckberg 1997), play a role. Early research of Paul Morhai (1997) and more recent research of McCright (2010) suggest that gender differences in environmental concern exist; however, they contend that this is a result of a difference in socialisation experiences rather than social roles.

In context of this study, no gender difference was observed. The researcher argues that two factors may have played a role in this result in the German context. The intense and ongoing public discussion of the topic of CO_2 emissions over recent years and the presence of environmental impact considerations in many purchase decisions means that both genders have developed extensive knowledge of the topic. In extant literature, knowledge has been shown to have an inconclusive effect on concern – a positive correlation between the two is often seen in women, whereas an inverse effect is more likely to be observed in men. In the context of this research, CO_2 emission reduction is a complex topic, which requires further research and scientific understanding in addition to following public discussion. Therefore, it is assumed that a greater concern for the environment often observed in females can be levelled out by a deeper scientific knowledge and understanding of climate change more often seen in men. The research findings are merely indicative, contributing to inconclusive results in existing literature. Further research on CO_2 emission reduction and its effect on consumer purchase decisions may benefit from a more in-depth examination of the effect of gender on climate change knowledge and concerns (McCright, 2010).

H12: Consumers' education level moderates relations in the research model with an effect on the consumers' purchase intention for dairy products produced by manufacturers committed to CO2 emission reduction.

Testing for the moderation effect of education level showed that no moderation effect could be observed in the study.

There is a tendency, in existing literature, to argue that education as an important variable in explaining a high level of environmental concern and pro-environmental behaviour (Zilahy and Huisingh, 2009; Zsóka et al., 2012, Blomquist and Whitehead, 1998; Engel and Pötschke, 1998;

Witzke and Urfei, 2001; Israel and Levinson, 2004; Veisten et al., 2004). Several studies support the positive effect of a higher level of education on consumer concern about environmental quality and on the motivation to engage in environmentally responsible behaviour, based on better awareness of potential damage (Lozano, 2006; Olli et al., 2001). Results of a study of causal effects of educational attainment on pro-environmental behaviour, conducted by Meyer (2015), found some indication that education may make individuals more aware of the external effects of their behaviour and more concerned with social welfare; however, this research did not have the data to explain the underlying mechanism behind this effect.

However, some studies show no or little evidence of the moderation effect of education. Others even suggest a negative relation between education level and model variables. In a study conducted by Ek and Sonderholm (2008), for example, only a small effect was shown in the context of green electricity. Ayalon et al. (2014) did not find any effect of education on recycling behaviour. Grafton (2014) even suggested a negative association between education level and water conservation. Engels et al. (2013) stated that people who are better informed are less likely to be sceptical about climate change, which they indicated is the case in Germany. Sceptics are observed to be less aware of societal risks and worry less. Scepticism seems to be connected to broader attitudinal variables, which are not necessarily linked to environmental issues.

In general, as Meyer (2015) mentioned, it is not clear whether education teaches individuals to be better citizens, and pro-environmental behaviour is one manifestation of this. Whether pro-environmental behaviour forms part of social norms through exposure to more people who are environmental conscious, or whether a lower level of bias encourages people to take on the immediate cost of pro-environmental behaviour in exchange for the future benefit of the behaviour is subject to debate.

This study shows that education has no moderation effect on the behavioural intention to buy dairy products, produced by companies which are committed to CO_2 emission reduction. The researcher follows the argument of Engels et al. (2013), stating that climate change scepticism, which is correlated with environmental concerns, does not show a correlation with education in the German context. This varies from results in other contexts, such as Anglo-American cultures. It can be argued that intense political and public discussion around climate change,

high information levels, and a favourable political climate for the transition to renewable energy in Germany supports general environmental concern among consumers. This is not dependent on the education level of consumers. In the German context, therefore, the transition to a low-carbon lifestyle, which extends to grocery shopping purchase behaviour for dairy products, seems to be of interest to consumers.

If further research were to be conducted on this topic, it would be valuable to examine whether other types of interventions outside of the traditional education system, e.g. level of inclusion of pro-environmental education, peer group exposure to environmental consciousness, or understanding of the consumer bias, influence consumer preference towards short-term environmental benefit or greater long-term benefit of pro-environmental behaviour. This information might provide better insights into consumer behaviour, especially in countries such as Germany, where climate change scepticism is low and education level does not affect pro-environmental behavioural intention. This information could also facilitate understanding on how to encourage more environmentally conscious behavioural intention, triggering pro-environmental purchase behaviour and nudging consumers towards a low-carbon lifestyle.

8.3   Overall conclusion

This research taps into an interesting new field of research around pro-environmental consumer behaviour in the context of purchase decisions for low involvement products, such as dairy products.

Behavioural intention for dairy products produced under the consideration of CO_2 emission reduction is mainly driven by moral norms and attitude. For the most part, moral norms, activated by awareness of consequences and ascription of responsibility, explain behavioural intention to purchase dairy products produced by companies that are committed to CO_2 emission reduction. Attitude is partly explained by EBE and SCM, and mediates the impact of moral norms on intention. Attitude also has a considerable effect on intention. The other constructs - behaviour control and subjective norms - show minor to no impact on behavioural intention. These findings clearly indicate that pro-environmental behaviour is driven by moral obligations.

This study extends existing academic literature regarding consumer purchase decisions for low involvement products by adding pro-environmental considerations to the consumer research decision. The framework is advanced by:

- integrating the pro-social and self-interest approach in the context of the purchase decision for a low-involvement product in one model;

- providing an improved understanding of the motivational stage of consumers considering CO_2 emission reduction in their behavioural intention building when purchasing low-involvement products, such as dairy products; *and*

- including context specific "reasons for" and "reasons against" the given behaviour into the model, thereby adding the justification and defence mechanisms.

8.3.1 Contribution to knowledge

Pro-environmental consumer purchase decisions have been researched mainly in the context of high involvement products. To contribute to knowledge, this research sets out to implement a pro-environmental perspective into the consumer decision making process for low involvement products.

So far, little effort has been made to incorporate altruistic motives into the consumer decision making process for daily goods, such as dairy products. In order to examine the role of altruistic motives – namely the consideration of CO_2 emission reduction – a theoretically grounded model was developed and tested. The model integrates two existing models often used in pro-environmental behavioural consumer research – the Behavioural Reasoning Theory and the Norm Activation Model. Considering the different perspectives offered by the two models was considered important when studying the complexity of pro-environmental behaviour, as well as in the context of purchase decisions for low involvement products.

The findings of this research demonstrate an improvement in predictive power of behavioural intention through use of the combined model. Consequently, the definition of the conceptual model, incorporating moral and self-interest motives in the consumer decision making process for low involvement products, advances the existing consumer decision making model.

Consequently, the developed model is considered to be a useful framework for predicting consumer purchase intention for low involvement, pro-environmental products.

The following are the main theoretical contributions of this thesis:

1. This thesis develops and empirically validates a framework based on strong theoretical models to improve the prediction of consumer purchase intention for dairy products as low involvement products when pro-environmental motives are applied. The attitudinal model, BRT, and the pro-social model, NAM, represent two strong theories, applied in the context of consumer purchase decision making for low involvement products on the example of dairy products. To develop the research framework the two theories were integrated. Several researchers combined different theoretical models to increase the predictive power of behavioural intention in the context of pro-environmental decision making, mainly the TPB and NAM *(e.g.,* Bamberg et al., 2009; Park and Han, 2014; Onwezen et al., 2013; Shin et al., 2018). Combining self-interest and pro-social factors has often helped to develop a more comprehensive understanding of behavioural purchase intention. To the best of the researchers knowledge this research is the first approach combining the BRT and NAM in the pro-environmental context. The developed application of this research framework improves the predictability of behavioural purchase intention and therewith contributes theory.

2. This study sheds light on the importance of moral obligations in the context of pro-environmental consumer purchase decisions for low involvement products. The research results theoretically affirm that moral obligations are the strongest predictor for choosing dairy products produced under the consideration of CO_2 emission reduction. This finding is consistent with Thøgersen (2009), indicating that environmentally friendly purchase behaviour is strongly based on moral reasoning. Environmental concerns enhance the internalised norms of consumers and drive the purchase decision for dairy products from companies that are committed to CO_2 emission reduction. These internalised norms are activated by awareness of consequences and ascription of responsibility. Whereas prior research (*e.g.*, Shin et al., 2018; Ryan and Casidy, 2018; Vermeir and Verbeke (2008) on low involvement products considers attitude to be the main driver, the results of this

research clearly indicate that integrating CO_2 emission reduction into the communication of low involvement products, such as dairy products, changes the consumer purchase decision process. Moral obligations become the most important motivator for consumers with a direct and indirect effect on purchase intention. In line with Thøgersen's (2012) findings, the consumer involvement important for pro-environmental behaviour is directed towards the issue of CO_2 emission reduction and not towards the product itself. Accordingly, this study contributes to theory and extends the knowledge around the consumer purchase decision process for low involvement products, when pro-environmental considerations are included in the decision approach.

3. This research confirms that attitude is clearly differentiated from personal norms. Attitude reflects the overall positive or negative evaluations towards behavioural intention, whereas PN describes the individual's feeling about whether a behaviour is inherently right or wrong. The clear differentiation has been successfully applied in different pro-environmental contexts *(e.g.,* Park and Ha. 2014; Han et al., 2015; Shin et al., 2018) indicating significant effects of attitude and personal norms on behavioural intention. The research on CO_2 emission reduction in the dairy industry confirms the improvement of the predictive power of the research model by integrating attitude and personal norms. Considering CO_2 emission reduction in the model changes the impact of PN and AT - PN exhibit a stronger effect on behavioural intention than AT. This finding supports Park and Ha's (2014) findings in the context of recycling, but adds to studies focusing on organic food *(e.g.*, Shin et al., 2018), where AT represents the main factor. This leads to the conclusion that the nature of the attribute added to the product message is critical, whether it is more self-interested, such as organic food purchases, or altruistic, such as recycling or CO_2 emission reduction. Furthermore, PN influences AT significantly, but this effect only explains part of attitude and does not change the predictive power of the model. The theoretical contribution of this thesis is that the integration of an altruistic motive like CO_2 emission reduction alters the consumers pro-environmental purchase decision process: PN becomes the main driver, AT has a lower, but significant effect on the purchase intention as well as PN explains parts of AT.

4. Attitude has an effect on consumer purchase intention, even though PN is the main construct driving consumer purchase intention in the context of this study. This research contributes

to knowledge by indicating that the cognitive effect of attitude, as a predictor of consumer purchase intention for low involvement products, is reduced when pro-environmental arguments are added into the decision process. These results affirm former research conducted for by Park and Han (2014) on consumer recycling behaviour, which clearly can be defined as pro-social behaviour. This researcher argues that the reduction of attitude as a driver of purchase intention for food products is caused by the internalisation of moral obligations when altruistic benefits in form of environmental quality like CO_2 emission reduction are added to the communication. The internalisation is independent from SN, that means that consumers do not need a recognition from others to act pro-socially. These findings add to current knowledge for pro-environmental food consumption, but they must be assessed together with other relevant benefits and arguments, such as price, when purchasing food products. Moreover, attitude mediates the effect of personal norms on purchase intention, meaning that the effect of attitude is partly influenced by personal norms. This thesis contributes to theory by suggesting that attitude provides an important effect on behavioural purchase intention alongside with personal norms, when researching on pro-environmental purchase behaviour.

5. Applying the BRT in the context of pro-environmental consumer decision making is one of the main contributions of this research. The BRT developed by Westaby (2005) is a relatively new theory being successfully used in pro-environmental research for example by Claudy et al. (2015), Casidy and Ryan (2018), Diddi et al. (2019), Tandon et al., 2020 and is projected to continuingly and is expected to attract greater attention in the coming years. In this research the integration of the BRT into the research framework together with the NAM opens the possibility to explain attention by adding the drivers "reasons for" and "reasons against". In the context of this study, two reason constructs influence the consumer decision – environmental benefits and scepticism. When CO_2 emission reduction is added as attribute to food products like dairy products, environmental benefits become a positive driver for attitude, whereas scepticism impacts attitude negatively, both being used to justify and defend the consumer decision. These findings confirm prior research conducted by Diddi et al.'s (2019) and Tandon et al.'s (2020), who found besides other drivers and barriers, environmental benefits and scepticism as important factors. The theoretical contribution of this thesis is that applying the BRT improves the understanding

of the consumer pro-environmental decision process for low involvement products by identifying constructs – EBE and SCM - which activate consumers justify and defence mechanism.

6. This research confirms that the relationship between awareness of consequences, ascription of responsibility, and personal norms is partially mediated, which is in line with research for example conducted by Stern et al. (1999), Stern (2000) and de Groot and Steg (2005). Awareness of consequences shows a direct and indirect effect on personal norms, the latter via ascription of responsibility. Thus, this research confirms that the moral norms of consumers can be activated directly by recognising negative consequences of the behaviour, as well as through the feeling of responsibility for the negative consequences.

8.3.2   Implication for practitioners

This research sets out to support the dairy industry in attracting consumer attention to their CO_2 emission reduction efforts and increase consumer contribution to reaching ambitious CO_2 emission reduction goals. Communication around CO_2 emissions faces several challenges in the context of the dairy industry, including:

1. The complexity of CO_2 emission reduction in the dairy industry across the production lifecycle (i.e. from farm to shelf);
2. A strong focus on health from industry and consumers when purchasing dairy products, strengthening the self-interest of consumers.
3. The low involvement purchase decision process for daily products, such as dairy.

This thesis contributes to practise as follows:

1. The findings clearly show that by activating and internalising moral obligations into the consumers' purchase decision process companies and policymakers can increase consumers' purchase intention of dairy products produced under a commitment to CO_2 emission reduction. It is important to gain a more in-depth understanding of the circumstances under which pro-social behaviour has a greater predictive power in relation to consumer purchase intention than cognitive behaviour. This can facilitate companies to better understand how to reinforce consumer pro-environmental decision making.

According to this research, moral norms can be strengthened by focusing on awareness of consequences. This means that consumers have to be aware of CO_2 emissions in the dairy industry and understand the associated impacts. To reinforce the effect of personal norms and the internalisation of motives on consumer purchase intention, a clear communication – Marketing and PR - strategy has to be developed to increase consumer awareness of CO_2 emissions within the industry, as well as consumer awareness of consequences and ascription of responsibility. More concrete, dairy companies should inform the consumers about their contribution to environmental conservation, even if the detrimental impact of the industry on the environment is in focus. Many beneficial activities have been started and even little steps must be shared in order to develop consumer trust and comprehension. An educational information campaign aimed at the general public could support the industry's strategy.

2. The purchasing process for dairy products is a low involvement process, meaning that consumers do not spend much time on their purchase decision. This research suggests that the consumer purchase decision process can be changed through the incorporation of pro-environmental arguments, such as CO_2 emission reduction. The findings demonstrate that attitudes retain a significant role in predicting consumer purchase intention, even when the main focus is on the moral obligations. Attitude is strengthened through environmental benefits and is weakened by scepticism. In order to consider scepticism, it is critical that communication be as accurate and honest as possible. Consumers' increasing awareness of CO_2 emissions raises their scepticism, and they are already highly sensitive to greenwashing. Communication that leaves consumers with any uncertainties can have a detrimental impact on their attitude and, as a result, on their purchasing intentions. Based on the findings of this research, the researcher concludes that while the effects and consequences of CO_2 emissions on the environment are communicated extensively, and consumers are aware of CO_2 emission reduction and its pro-environmental effects, CO_2 emissions within the dairy industry are not in the consumer focus. Connecting public knowledge of the impact of CO_2 on the environment and the dairy industry's role in this can intensify consumer's environmental concerns and thereby reinforce knowledge of the environmental benefits and weaken the scepticism. Besides, by clearly indicating that products are produced under the commitment to CO_2 emission reduction with a label,

companies can support the consumers to be able to decide for pro-environmental products by applying their usual choice heuristics in the store.

3. The strong focus on health of dairy products in the market represents a challenge when trying to focus on pro-environmental topics. In communications around sustainability, the dairy industry focuses on the nutrient density scores (NDS score) of dairy products, which relate the nutrient density of a product to its Greenhouse Gas Emissions. This score supports the purchase of dairy products; this is due to a greater nutrient availability in dairy products, compared to plant-based products, which are often perceived as more environmentally friendly. This approach presents an interesting way forward; however, it places health at the forefront. This, in turn, puts a focus on self-interest motives and has the potential to detract from the dairy industry commitment to CO_2 emission reduction. Stressing the health benefits of dairy and focusing on the nutrition density score of dairy products can discourage consumers from looking for alternatives through an indirect link to pro-environmental behaviour. However, in order to strengthen pro-environmental communication and reinforce consumer moral obligations, the industry should work on a balanced approach. Altruistic communication has to be very clear. Dairy companies should use communication channels that are separate and distinct from those which are used to communicate the health benefits of their products. The health aspect of the product puts self-interest motives in focus. Although these may be influential, they detract from consumer focus on CO_2 emission reduction when communicated in parallel, i.e. using the same communication channels. The danger is, that – as seen in the organic food context –self-interest motives will be perceived as more important, which will reduce the effect of the pro-environmental activities of dairy companies on consumer purchase decisions. To develop this approach, it is recommended that future research should examine how companies can effectively use pro-environmental messaging alongside health-related messaging and how they can ensure that consumer moral obligations play an important role in their communication approach.

In conclusion, the results if this research point towards two areas, which have a direct effect on purchase intention in relation to dairy products produced under consideration of CO_2 emission reduction. These should be considered in the communication approach of dairy companies as follows:

1. Reinforce personal norms: this internalised norm can be strengthened by relating company communication and public information to the positive impact of CO_2 emission reduction.

2. Increase the positive attitude of consumers towards purchasing dairy products: this can be achieved by improving the extent of information which links the dairy industry and CO_2 emission reduction, and the positive effect of this.

In order to develop a successful approach, dairy companies need to balance pro-environmental arguments with health-related information around dairy products. This will enable them to maximise the positive effect of moral obligations on consumer purchase intention when communicating on CO_2 emission reduction.

8.4 Limitations and directions for future research

This study provides insight into the consumer purchase intention to consider CO_2 emission reduction in the context of low involvement product purchases. It is one of the first studies focusing on consumer contribution to CO_2 emission reduction, targeting low involvement purchase decisions. This research creates opportunities for future research to build on its learnings and use its findings to develop future research approaches.

Firstly, this study focuses on the purchase intention for dairy products – low involvement products - produced under the consideration of CO_2 emission reduction. It is one of the first studies on consumer consideration of CO_2 emission reduction in the context of a low involvement purchase decision. The reason for not considering purchase behaviour in the context of this study was the limited availability of information on CO_2 emission reduction in connection with the different food products. Based on increasing discussion around CO_2 emission reduction and available information related to different industries, including the food industry, future research should focus on purchase behaviour in addition to intention building. It is important to consider this in the context of industries and products where CO_2 emission reduction is communicated in connection with the products, and where it can be expected that the consumers are aware of CO_2 reduction activities within the industry.

Secondly, due to the limited time and budget for this thesis, an online panel was used for the study. Limitations for using an online panel are mainly centred around the representativeness and the limited generalisability. Not all individuals who fall into the target population are part of the online panel, which can lead to a sampling frame error (Malhotra and Birks, 2017). To achieve a representative sample, future research could randomly collect data from the general population.

Thirdly, the nature of CO_2 emission reduction in the food industry is a quite new topic and a more qualitative approach can add to the chosen quantitative survey to get some more in depth insights and unbiased causal inferences into the consumer decision making process. A more explorative research in form of an experimental design would have the advantage, that behavioural changes towards pro-environmental behaviour can be observed or self-reported. Using different contextual interventions will provide the possibility to draw conclusion on the behavioural change. Another qualitative approach could be consumer interviews in shops, directly in connection with the purchase. This would add the "real life" situation and a more realistic result as soon as CO_2 emission reduction is communicated more widely in the industry. In this context adding a collection of actual purchase data over time and a comparison of the development of products with and without communication of CO_2 emission reduction could provide valuable information and would help to further the discussed on the intention – behaviour gap.

Fourth, focusing only on CO_2 emission reduction is a clear limitation of this study. For future research, other important decision factors for dairy products like price, health aspects, brands, should be included in the research approach. A conjoint analysis could help to conduct valuable analysis and define the trade-offs between the pro-environmental communication and other important decision criteria for dairy products.

Fifth, based on the research findings "reasons for" and "reasons against" the consumer purchase intention have an effect on consumers attitude. A more detailed qualitative examination and definition of relevant "reasons for" and "reasons against" purchasing low involvement products produced under the consideration of CO_2 emission reduction before the quantitative approach could help to strengthen the findings and help companies to develop a successful communication approach. Future research should adopts a more detailed approach with respect to "reasons for" and "reasons against" as this could add further insight into consumer purchase decisions.

Sixth, the findings of this research show that awareness of consequences strongly influences the personal norms, but not differentiating between general knowledge of the consumers and information connected to the dairy industry. Future research should evaluate whether awareness of consequences of CO_2 emissions is based on general knowledge from discussions in the media, in politics, and in society, or whether it can be clearly connected to the industry in scope. This will be highly relevant for the development of an effective communication approach for CO_2 emission reduction within the industry.

Finally, CO_2 emissions are being intensively discussed in politics, industry, and amongst the general public. Research shows that consumers consider CO_2 emission reduction in their purchase decision process. The question is whether their awareness and consideration of CO_2 emission reduction is driven by general discussion of the topic or whether it is directly linked to industry. Future research should include the possibility to differentiate between general awareness and knowledge of CO_2 emission reduction and information regarding the researched industry and include the effect of general knowledge on the scepticism of the consumers.

Appendices

A.1 Outer Loadings

	Ascription of responsibility	Attitude	Awareness of consequences	Behavioural control	Intention	Personal Norm	Social Norms
Q11_1		0.834					
Q11_2		0.821					
Q11_3		0.839					
Q11_4		0.823					
Q11_5		0.798					
Q12_1		0.837					
Q12_2		0.845					
Q13_1							0.893
Q13_2							0.899
Q13_3							0.873
Q13_4							0.870
Q13_5							0.747
Q14_1				0.777			
Q14_2				0.859			
Q14_3				0.530			
Q14_4_recode				0.606			
Q15_1						0.884	
Q15_2						0.908	
Q15_3						0.903	
Q15_4						0.894	
Q16_1			0.756				
Q16_2			0.800				
Q16_3			0.803				
Q16_4			0.738				
Q16_5			0.814				
Q16_6			0.842				
Q16_7			0.751				
Q16_8			0.572				
Q16_9			0.783				
Q17_1	0.863						
Q17_2	0.868						
Q17_3	0.851						
Q17_4	0.765						
Q17_5_recode	0.357						
Q18_1					0.840		
Q18_2					0.909		
Q18_3					0.864		

A.2 Outer Loadings – Reason constructs

	Environmental benefit	Trust	Image of Dairy	Other decision criteria	PCD	Scepticism
Q9_2	0.716					
Q9_3	0.819					
Q9_4	0.788					
Q9_5		0.693				
Q9_6		0.775				
Q9_7		0.785				
Q9_8		0.632				
Q9_9		0.765				
Q9_10		0.604				
Q9_11	0.828					
Q10_1						0.817
Q10_2						0.489
Q10_3						0.767
Q10_4						0.615
Q10_5						0.592
Q10_6			0.821			
Q10_7						0.414
Q10_8						0.317
Q10_9					0.722	
Q10_10					0.738	
Q10_11				0.513		
Q10_12				0.625		
Q10_13					0.775	
Q10_14			0.781			
Q10_15					0.771	
Q10_16				0.645		
Q10_17				0.795		
Q10_18						0.216

A.3 – Cross Loadings - Reasons

Cross Loadings Reason items	Environ-mental benefit	Image of Dairy	Other decision criteria	PCD	Scepti-cism	Trust
Q9_2	0.716	0.228	0.051	-0.153	-0.092	0.510
Q9_3	0.819	0.265	0.021	-0.270	-0.205	0.498
Q9_4	0.788	0.250	0.079	-0.168	-0.122	0.576
Q9_5	0.427	0.218	0.116	-0.224	-0.116	0.692
Q9_6	0.543	0.200	0.114	-0.111	-0.069	0.779
Q9_7	0.543	0.244	0.117	-0.166	-0.068	0.792
Q9_8	0.346	0.169	0.160	0.036	0.070	0.616
Q9_9	0.520	0.257	0.112	-0.243	-0.072	0.773
Q9_11	0.828	0.248	0.018	-0.238	-0.194	0.519
Q10_1	-0.199	0.116	0.332	0.485	0.823	-0.032
Q10_3	-0.143	0.189	0.380	0.490	0.772	-0.063
Q10_4	-0.096	0.214	0.278	0.386	0.626	-0.111
Q10_5	-0.070	0.235	0.319	0.419	0.594	-0.094
Q10_6	0.246	0.821	0.245	0.134	0.227	0.213
Q10_9	-0.148	0.190	0.329	0.722	0.493	-0.045
Q10_10	-0.198	0.115	0.249	0.738	0.391	-0.206
Q10_12	0.030	0.126	0.699	0.303	0.321	0.110
Q10_13	-0.207	0.108	0.240	0.775	0.459	-0.226
Q10_14	0.257	0.781	0.197	0.098	0.138	0.267
Q10_15	-0.235	0.046	0.319	0.771	0.517	-0.144
Q10_16	0.016	0.215	0.654	0.217	0.287	0.041
Q10_17	0.058	0.264	0.824	0.293	0.368	0.167

A.4 Reliability and Validity (all items considered)

All items considered (before removing items from the constructs)	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
Ascription of responsibility	0.802	0.851	0.869	0.587
Attitude	0.924	0.926	0.939	0.686
Awareness of consequences	0.910	0.918	0.927	0.586
BC	0.655	0.698	0.793	0.497
Environmental benefit	0.797	0.805	0.868	0.623
Image of Dairy	0.442	0.444	0.782	0.642
Intention	0.841	0.843	0.904	0.760
Other decision criteria	0.546	0.568	0.743	0.425
PCD	0.745	0.752	0.839	0.565
Personal Norm	0.919	0.921	0.943	0.805
Scepticism	0.786	0.767	0.766	0.318
Social Norms	0.909	0.915	0.933	0.736
Trust	0.815	0.842	0.860	0.508

A.5 – Result after removing the items

Measurement Model

		Items	Loadings[a]	AVE[b]	CR[c]	Cronbach's Alpha[d]
Reasons for	**Environmental benefits**	Q9_11	0.828	0.623	0.868	0.797
		Q9_2	0.716			
		Q9_3	0.819			
		Q9_4	0.788			
	Trust	Q9_5	0.692	0.538	0.852	0.788
		Q9_6	0.779			
		Q9_7	0.792			
		Q9_8	0.616			
		Q9_9	0.773			
Reaosns against	**Scepticism**	Q10_1	0.823	0.505	0.800	0.701
		Q10_3	0.772			
		Q10_4	0.626			
		Q10_5	0.594			
	Image dairy	Q10_6	0.821	0.642	0.782	0.442
		Q10_14	0.781			
	Purchase criteria dairy	Q10_9	0.721	0.565	0.839	0.745
		Q10_10	0.738			
		Q10_13	0.775			
		Q10_15	0.771			
	Other decision criteria	Q10_12	0.699	0.532	0.771	0.570
		Q10_16	0.655			
		Q10_17	0.824			
Attitude		Q11_1	0.834	0.686	0.939	0.926
		Q11_2	0.819			
		Q11_3	0.839			
		Q11_4	0.822			
		Q11_5	0.798			
		Q12_1	0.838			
		Q12_2	0.846			
Social Norms		Q13_1	0.893	0.736	0.933	0.915
		Q13_2	0.899			
		Q13_3	0.873			
		Q13_4	0.870			
		Q13_5	0.747			
Behavioural Control		Q14_1	0.911	0.807	0.893	0.762
		Q14_2	0.886			
Personal Norms		Q15_1	0.885	0.805	0.943	0.920
		Q15_2	0.907			
		Q15_3	0.903			
		Q15_4	0.895			
Awareness of Consequences		Q16_1	0.755	0.623	0.930	0.913
		Q16_2	0.800			
		Q16_3	0.803			
		Q16_4	0.739			
		Q16_5	0.814			
		Q16_6	0.842			
		Q16_7	0.750			
		Q16_9	0.784			
Ascription of responsibility		Q17_1	0.874	0.716	0.909	0.865
		Q17_2	0.884			
		Q17_3	0.859			
		Q17_4	0.761			
Intention		Q18_1	0.841	0.760	0.904	0.843
		Q18_2	0.909			
		Q18_3	0.863			

a All Item Loadings > 0.5 indicated indicator reliability (Hulland, 1999)

b All average variance extracted (AVE) > 0.5 indicates convergent reliability (Bagozzi and Yi (1988); Fornell and Larcker (1981))

c All composite reliability (CR) > 0.7 indicates interal consistency (Gefen et al., 2000)

d All Cronbach's Alpha > 0.7 indicates indicator reliability (Nunnally, 1978)

A.6 Polychoric Factor Analysis

For each of the reasons for and reasons against scales to be unidimensional
the EFA should suggest only one factor – in other words there should only be
one Eigenvalue greater than 1. This holds for both of the reasons for and all
bar one of the reasons against (image diary).

Reasons for:

Environmental Benefits

```
Factor analysis/correlation                    Number of obs    =        791
    Method: principal factors                  Retained factors =          1
    Rotation: (unrotated)                      Number of params =          4

        --------------------------------------------------------------------
        Factor  |  Eigenvalue   Difference        Proportion   Cumulative
        --------+-----------------------------------------------------------
        Factor1 |     2.34984     2.41660            1.1426       1.1426
        Factor2 |    -0.06676     0.02057           -0.0325       1.1101
        Factor3 |    -0.08733     0.05177           -0.0425       1.0676
        Factor4 |    -0.13910        .              -0.0676       1.0000
        --------------------------------------------------------------------
    LR test: independent vs. saturated:  chi2(6)  = 1461.25 Prob>chi2 = 0.0000
```

Factor loadings (pattern matrix) and unique variances

```
        ----------------------------------------
        Variable |  Factor1 |   Uniqueness
        ---------+----------+-------------
           q9_11 |   0.8046 |     0.3526
            q9_2 |   0.6764 |     0.5425
            q9_3 |   0.8203 |     0.3271
            q9_4 |   0.7564 |     0.4278
        ----------------------------------------
```

Trust

```
Factor analysis/correlation                    Number of obs    =        791
    Method: principal factors                  Retained factors =          2
    Rotation: (unrotated)                      Number of params =          9

        --------------------------------------------------------------------
        Factor  |  Eigenvalue   Difference        Proportion   Cumulative
        --------+-----------------------------------------------------------
        Factor1 |     2.57906     2.39237            1.0949       1.0949
        Factor2 |     0.18669     0.28012            0.0793       1.1742
        Factor3 |    -0.09343     0.04944           -0.0397       1.1345
        Factor4 |    -0.14287     0.03112           -0.0607       1.0739
        Factor5 |    -0.17399        .              -0.0739       1.0000
        --------------------------------------------------------------------
    LR test: independent vs. saturated:  chi2(10) = 1608.38 Prob>chi2 = 0.0000
```

Factor loadings (pattern matrix) and unique variances

```
        ----------------------------------------------------
        Variable |  Factor1   Factor2 |   Uniqueness
        ---------+-------------------+-------------
            q9_5 |   0.6636   -0.2435 |     0.5003
            q9_6 |   0.7284    0.1622 |     0.4432
            q9_7 |   0.7659    0.0486 |     0.4110
            q9_8 |   0.6629    0.2411 |     0.5024
            q9_9 |   0.7630   -0.2014 |     0.3773
        ----------------------------------------------------
```

Reasons against:

Scepticism

```
Factor analysis/correlation                     Number of obs    =         791
    Method: principal factors                   Retained factors =           2
    Rotation: (unrotated)                        Number of params =           6

    --------------------------------------------------------------------------
        Factor  |   Eigenvalue   Difference         Proportion   Cumulative
    ------------+-------------------------------------------------------------
        Factor1 |     1.79020     1.74395             1.2008       1.2008
        Factor2 |     0.04625     0.18336             0.0310       1.2318
        Factor3 |    -0.13711     0.07136            -0.0920       1.1398
        Factor4 |    -0.20847          .             -0.1398       1.0000
    --------------------------------------------------------------------------
    LR test: independent vs. saturated:  chi2(6)  =  883.44 Prob>chi2 = 0.0000

Factor loadings (pattern matrix) and unique variances

    ----------------------------------------------------
        Variable |  Factor1    Factor2 |  Uniqueness
    ------------+--------------------+-------------
           q10_1 |   0.5878     0.1496 |    0.6321
           q10_3 |   0.7631     0.0582 |    0.4143
           q10_4 |   0.6451    -0.0889 |    0.5759
           q10_5 |   0.6680    -0.1122 |    0.5412
    ----------------------------------------------------
```

Image Diary

```
Factor analysis/correlation                     Number of obs    =         791
    Method: principal factors                   Retained factors =           1
    Rotation: (unrotated)                        Number of params =           1

    --------------------------------------------------------------------------
        Factor  |   Eigenvalue   Difference         Proportion   Cumulative
    ------------+-------------------------------------------------------------
        Factor1 |     0.48997     0.72043             1.8881       1.8881
        Factor2 |    -0.23046          .             -0.8881       1.0000
    --------------------------------------------------------------------------
    LR test: independent vs. saturated:  chi2(1)  =  109.72 Prob>chi2 = 0.0000

Factor loadings (pattern matrix) and unique variances

    ------------------------------------------
        Variable |  Factor1 |  Uniqueness
    ------------+----------+-------------
           q10_6 |   0.4950 |     0.7550
          q10_14 |   0.4950 |     0.7550
    ------------------------------------------
```

> The low eigenvalue arises because of the comparatively low loadings. If the measurement model results look OK, this won't be such an issue.

A.7 Cross Loadings Measurement Model

Cross Loadings

	Ascription of responsibility	Attitude	Awareness of consequences	Behavioural control	Environmental benefit	Image of Dairy	Intention	Other decision criteria	PCD	Personal Norm	Skepticism	Social Norms	Trust
Q10_1	-0.176	-0.337	-0.295	-0.023	-0.199	0.116	-0.264	0.332	0.485	-0.248	0.823	-0.083	-0.032
Q10_10	-0.164	-0.212	-0.154	-0.131	-0.198	0.115	-0.274	0.249	0.738	-0.233	0.391	-0.156	-0.206
Q10_12	-0.019	-0.064	-0.103	0.082	0.030	0.126	-0.045	0.699	0.303	-0.070	0.321	0.041	0.110
Q10_13	-0.221	-0.254	-0.223	-0.123	-0.207	0.108	-0.339	0.240	0.775	-0.280	0.459	-0.169	-0.226
Q10_14	0.284	0.145	0.302	0.192	0.257	0.781	0.231	0.197	0.098	0.263	0.138	0.267	0.267
Q10_15	-0.212	-0.258	-0.255	-0.092	-0.235	0.046	-0.307	0.319	0.771	-0.285	0.517	-0.158	-0.144
Q10_16	-0.018	-0.043	-0.070	-0.019	0.016	0.215	-0.062	0.654	0.217	-0.042	0.287	-0.035	0.041
Q10_17	0.024	-0.079	-0.077	0.049	0.058	0.264	-0.040	0.824	0.293	-0.022	0.368	0.078	0.167
Q10_3	-0.131	-0.211	-0.194	-0.116	-0.143	0.189	-0.236	0.380	0.490	-0.165	0.772	-0.118	-0.063
Q10_4	-0.074	-0.149	-0.042	-0.091	-0.096	0.214	-0.130	0.278	0.386	-0.095	0.626	-0.072	-0.111
Q10_5	-0.055	-0.119	-0.068	-0.108	-0.070	0.235	-0.180	0.319	0.419	-0.100	0.594	-0.084	-0.094
Q10_6	0.212	0.158	0.191	0.071	0.246	0.821	0.188	0.245	0.134	0.252	0.227	0.169	0.213
Q10_9	-0.091	-0.198	-0.133	-0.071	-0.148	0.190	-0.199	0.329	0.722	-0.158	0.493	-0.042	-0.045
Q11_1	0.358	0.834	0.443	0.215	0.413	0.146	0.542	-0.074	-0.236	0.505	-0.266	0.334	0.302
Q11_2	0.388	0.821	0.456	0.138	0.399	0.123	0.516	-0.125	-0.246	0.486	-0.294	0.231	0.214
Q11_3	0.463	0.839	0.458	0.246	0.451	0.184	0.606	-0.093	-0.298	0.583	-0.267	0.427	0.355
Q11_4	0.438	0.823	0.471	0.217	0.417	0.134	0.556	-0.080	-0.262	0.543	-0.258	0.377	0.314
Q11_5	0.388	0.798	0.414	0.203	0.358	0.109	0.521	-0.048	-0.259	0.487	-0.258	0.351	0.292
Q12_1	0.479	0.837	0.489	0.241	0.492	0.200	0.590	-0.047	-0.237	0.567	-0.259	0.393	0.353
Q12_2	0.479	0.845	0.486	0.221	0.478	0.188	0.586	-0.048	-0.255	0.577	-0.267	0.398	0.376
Q13_1	0.480	0.383	0.437	0.363	0.404	0.217	0.503	0.039	-0.186	0.576	-0.140	0.893	0.472
Q13_2	0.476	0.392	0.446	0.381	0.427	0.272	0.505	0.049	-0.165	0.591	-0.113	0.899	0.477
Q13_3	0.458	0.386	0.434	0.376	0.410	0.245	0.496	0.055	-0.152	0.586	-0.087	0.873	0.497
Q13_4	0.426	0.417	0.399	0.361	0.428	0.219	0.501	0.053	-0.165	0.561	-0.124	0.870	0.475
Q13_5	0.386	0.281	0.333	0.350	0.344	0.201	0.413	0.030	-0.094	0.499	-0.050	0.747	0.462
Q14_1	0.279	0.211	0.255	0.911	0.290	0.175	0.368	0.060	-0.143	0.380	-0.059	0.429	0.453
Q14_2	0.254	0.254	0.242	0.886	0.281	0.109	0.327	0.047	-0.105	0.319	-0.118	0.332	0.346
Q15_1	0.629	0.550	0.599	0.384	0.561	0.306	0.677	-0.025	-0.243	0.884	-0.174	0.625	0.533
Q15_2	0.638	0.587	0.624	0.363	0.578	0.271	0.705	-0.051	-0.319	0.908	-0.208	0.580	0.504
Q15_3	0.637	0.630	0.690	0.326	0.610	0.301	0.743	-0.078	-0.298	0.903	-0.246	0.547	0.480
Q15_4	0.615	0.558	0.600	0.331	0.554	0.274	0.703	-0.054	-0.303	0.894	-0.227	0.609	0.508
Q16_1	0.514	0.480	0.761	0.200	0.444	0.241	0.552	-0.097	-0.238	0.535	-0.223	0.298	0.282
Q16_2	0.513	0.373	0.805	0.173	0.365	0.242	0.473	-0.113	-0.199	0.501	-0.199	0.327	0.235
Q16_3	0.589	0.458	0.808	0.276	0.449	0.248	0.522	-0.086	-0.196	0.557	-0.187	0.421	0.339
Q16_4	0.544	0.346	0.732	0.233	0.336	0.238	0.477	-0.029	-0.126	0.495	-0.083	0.418	0.354
Q16_5	0.560	0.455	0.818	0.207	0.446	0.264	0.533	-0.153	-0.238	0.566	-0.227	0.358	0.296
Q16_6	0.625	0.495	0.845	0.220	0.497	0.266	0.605	-0.104	-0.229	0.628	-0.226	0.438	0.354
Q16_7	0.525	0.494	0.755	0.244	0.510	0.190	0.591	-0.064	-0.248	0.588	-0.248	0.375	0.358
Q16_9	0.578	0.395	0.785	0.191	0.430	0.233	0.522	-0.070	-0.177	0.544	-0.213	0.381	0.353
Q17_1	0.874	0.438	0.604	0.226	0.446	0.271	0.513	0.018	-0.171	0.559	-0.121	0.370	0.373
Q17_2	0.884	0.404	0.581	0.226	0.468	0.256	0.510	0.012	-0.147	0.535	-0.133	0.371	0.386
Q17_3	0.859	0.441	0.609	0.206	0.467	0.231	0.543	-0.019	-0.212	0.580	-0.176	0.397	0.374
Q17_4	0.761	0.461	0.587	0.335	0.517	0.276	0.657	-0.012	-0.256	0.682	-0.152	0.598	0.537
Q18_1	0.530	0.641	0.594	0.272	0.522	0.221	0.840	-0.049	-0.265	0.651	-0.267	0.385	0.367
Q18_2	0.604	0.608	0.607	0.363	0.566	0.209	0.909	-0.067	-0.356	0.716	-0.272	0.542	0.522
Q18_3	0.598	0.522	0.574	0.377	0.540	0.252	0.864	-0.049	-0.366	0.693	-0.237	0.547	0.549
Q9_11	0.437	0.456	0.455	0.241	0.828	0.248	0.528	0.018	-0.238	0.539	-0.194	0.376	0.519
Q9_2	0.405	0.355	0.368	0.262	0.716	0.228	0.389	0.051	-0.153	0.435	-0.092	0.354	0.510
Q9_3	0.457	0.419	0.487	0.217	0.819	0.265	0.522	0.021	-0.270	0.530	-0.205	0.352	0.498
Q9_4	0.484	0.408	0.429	0.290	0.788	0.250	0.515	0.079	-0.168	0.516	-0.122	0.406	0.576
Q9_5	0.357	0.246	0.292	0.275	0.427	0.218	0.385	0.116	-0.224	0.411	-0.116	0.406	0.692
Q9_6	0.378	0.347	0.324	0.347	0.543	0.200	0.433	0.114	-0.111	0.430	-0.069	0.387	0.779
Q9_7	0.405	0.323	0.345	0.363	0.543	0.244	0.445	0.117	-0.166	0.453	-0.068	0.447	0.792
Q9_8	0.256	0.132	0.162	0.299	0.346	0.169	0.268	0.160	0.036	0.274	0.070	0.344	0.616
Q9_9	0.400	0.280	0.320	0.359	0.520	0.257	0.442	0.112	-0.243	0.454	-0.072	0.454	0.773

A.8 Parametric Test - Gender

Parametric test	Path Coefficients-diff (Female - Male)	t-Value (Female vs Male)	p-Value (Female vs Male)
AR --> PN	-0.039	0.506	0.613
AT --> IT	0.027	0.429	0.668
AC --> AR	0.036	0.804	0.422
AC --> PN	0.026	0.339	0.734
EBE --> AT	-0.026	0.331	0.741
IMD --> AT	**0.187**	**3.233**	**0.001**
ODC --> AT	-0.133	1.954	0.051
PCD -> AT	0.026	0.376	0.707
PN --> AT	-0.071	0.910	0.363
PN --> IT	-0.010	0.147	0.883
SKM --> AT	-0.070	0.969	0.333
SN --> IT	0.049	0.836	0.403
TRU --> AT	-0.047	0.664	0.507

A.9 Welch-Satterthwaite Test – Gender

Welch-Satterthwaite	Path Coefficients-diff (Female - Male)	t-Value (Female vs Male)	p-Value (Female vs Male)
AR --> PN	-0.039	0.507	0.613
AT --> IT	0.027	0.428	0.669
AC --> AR	0.036	0.803	0.422
AC --> PN	0.026	0.340	0.734
EBE --> AT	-0.026	0.331	0.741
IMD --> AT	**0.187**	**3.233**	**0.001**
ODC --> AT	-0.133	1.948	0.052
PCD -> AT	0.026	0.378	0.706
PN --> AT	-0.071	0.909	0.364
PN --> IT	-0.010	0.147	0.883
SCM --> AT	-0.070	0.968	0.334
SN --> IT	0.049	0.837	0.403
TRU --> AT	-0.047	0.665	0.506

A.10 Multi-Group Test Gender – Summary

Multi Group Test Results Path Coefficient	Permutation test	PLS-MGA	Parametric Test	Welch-Satterwaite t Test
AR --> PN				
AT --> IT				
AC --> AR				
AC --> PN				
EBE --> AT				
IMD --> AT	x	x	x	x
ODC --> AT	x			
PCD -> AT				
PN --> AT				
PN --> IT				
SCM --> AT				
SN --> IT				
TRU --> AT				

* Significant path (p<= 0.05)

A.11 MGA-Analysis Education Level

Path Coefficients	High vs. Low-level Education			High vs. Mid-level Education			Mid-level vs low level education		
	PLS MGA p value	Parametric test p value	Satterthwaite t Test p value	PLS MGA p value	Parametric test p value	Satterthwaite t Test p value	PLS MGA p value	Parametric test p value	Satterthwaite t Test p value
AR --> PN	0.605	0.589	0.607	0.428	0.413	0.427	0.733	0.811	0.730
AT --> IT	0.808	0.795	0.787	0.158	0.147	0.159	0.680	0.658	0.677
BC --> IT	0.465	0.454	0.465	0.310	0.289	0.310	**0.044***	**0.030***	**0.027***
EBE --> AT	0.624	0.615	0.623	0.247	0.273	0.248	0.308	0.291	0.296
IOD --> AT	0.448	0.459	0.492	0.743	0.753	0.734	0.442	0.409	0.384
ODC --> AT	0.818	0.825	0.831	0.755	0.772	0.744	0.370	0.343	0.368
PCD --> AT	0.298	0.313	0.314	0.943	0.938	0.939	0.788	0.793	0.773
PN --> AT	0.746	0.718	0.732	0.429	0.470	0.428	0.656	0.653	0.652
PN --> IT	0.512	0.53	0.518	0.122	0.101	0.131	0.436	0.452	0.433
SCM --> AT	0.427	0.396	0.427	0.058	0.062	0.054	0.349	0.375	0.333
SN --> IT	0.556	0.544	0.558	0.838	0.851	0.851	0.565	0.603	0.562
TRU --> AT	0.780	0.779	0.789	0.300	0.329	0.299	0.704	0.721	0.701

Significance level (p<= 0.10) for the difference in relationship (path) between the different groups

*Significant effect

A.12 Descriptive statistics question 20 and 21 / Age

Wie oft nutzen Sie die folgenden Verkehrsmittel? - Nutzung des Fahrrades oder zu Fuß gehen, wann immer dies möglich ist * AGE GROUPS Crosstabulation

Count

		AGE GROUPS				Total
		18 - 24	25 - 34	35 - 49	50 - 64	
Wie oft nutzen Sie die folgenden Verkehrsmittel? - Nutzung des Fahrrades oder zu Fuß gehen, wann immer dies möglich ist	oft	66	103	145	155	469
	gelegentlich	30	45	93	77	245
	nie	4	10	11	37	62
Total		100	158	249	269	776

Wie oft nutzen Sie die folgenden Verkehrsmittel? - Nutzung von öffentlichen Verkehrsmitteln * AGE GROUPS Crosstabulation

Count

		AGE GROUPS				Total
		18 - 24	25 - 34	35 - 49	50 - 64	
Wie oft nutzen Sie die folgenden Verkehrsmittel? - Nutzung von öffentlichen Verkehrsmitteln	oft	44	53	54	43	194
	gelegentlich	41	68	100	113	322
	nie	15	37	95	113	260
Total		100	158	249	269	776

Wie oft nutzen Sie die folgenden Verkehrsmittel? - Nutzung von Car Sharing/Car-Pooling * AGE GROUPS Crosstabulation

Count

		AGE GROUPS				Total
		18 - 24	25 - 34	35 - 49	50 - 64	
Wie oft nutzen Sie die folgenden Verkehrsmittel? - Nutzung von Car Sharing/Car-Pooling	oft	6	10	6	1	23
	gelegentlich	25	30	35	11	101
	nie	69	118	208	257	652
Total		100	158	249	269	776

Noch ein paar generelle Fragen
zu Ihrem Einkaufs- und Konsumverhalten. Welche der genannten Verhaltensweisen treffen auf Sie zu? - Energie sparen (z.B. Ausschalten des Lichtes, wenn ich den Raum verlasse) * AGE GROUPS Crosstabulation

Count

		AGE GROUPS				Total
		18 - 24	25 - 34	35 - 49	50 - 64	
Noch ein paar generelle Fragen zu Ihrem Einkaufs- und Konsumverhalten. Welche der genannten Verhaltensweisen treffen auf Sie zu? - Energie sparen (z.B. Ausschalten des Lichtes, wenn ich den Raum verlasse)	immer	48	88	144	177	457
	normaler-weise	42	57	80	82	261
	ab und zu	8	10	23	10	51
	selten	2	3	2	0	7
Total		100	158	249	269	776

Noch ein paar generelle Fragen
zu Ihrem Einkaufs- und Konsumverhalten. Welche der genannten Verhaltensweisen treffen auf Sie zu? - Einkauf von energiefreundlichen und / oder energieeffizienten Produkten (energieeffiziente Haushaltsgeräte, energieeffiziente Glühbirnen,...) * AGE GROUPS Crosstabulation

Count

		AGE GROUPS				Total
		18 - 24	25 - 34	35 - 49	50 - 64	
Noch ein paar generelle Fragen zu Ihrem Einkaufs- und Konsumverhalten. Welche der genannten Verhaltensweisen treffen auf Sie zu? - Einkauf von energiefreundlichen und / oder energieeffizienten Produkten (energieeffiziente Haushaltsgeräte, energieeffiziente Glühbirnen,...)	immer	19	64	102	135	320
	normaler-weise	57	67	114	101	339
	ab und zu	20	26	27	27	100
	selten	4	1	3	4	12
	nie	0	0	3	2	5
Total		100	158	249	269	776

Noch ein paar generelle Fragen
zu Ihrem Einkaufs- und Konsumverhalten. Welche der genannten Verhaltensweisen treffen auf Sie zu? - Umweltbewusster Wasserverbrauch (kurz duschen, Waschmaschine / Geschirrspüler vor dem Start vollständig füllen) * AGE GROUPS Crosstabulation

Count

		AGE GROUPS				Total
		18 - 24	25 - 34	35 - 49	50 - 64	
Noch ein paar generelle Fragen zu Ihrem Einkaufs- und Konsumverhalten. Welche der genannten Verhaltensweisen treffen auf Sie zu? - Umweltbewusster Wasserverbrauch (kurz duschen, Waschmaschine / Geschirrspüler vor dem Start vollständig füllen)	immer	31	65	105	157	358
	normaler-weise	50	55	113	90	308
	ab und zu	14	33	23	17	87
	selten	4	5	7	3	19
	nie	1	0	1	2	4
Total		100	158	249	269	776

Noch ein paar generelle Fragen
zu Ihrem Einkaufs- und Konsumverhalten. Welche der genannten Verhaltensweisen treffen auf Sie zu? - Recycling von Papier * AGE GROUPS Crosstabulation

Count

		AGE GROUPS				Total
		18 - 24	25 - 34	35 - 49	50 - 64	
Noch ein paar generelle Fragen zu Ihrem Einkaufs- und Konsumverhalten. Welche der genannten Verhaltensweisen treffen auf Sie zu? - Recycling von Papier	immer	47	93	166	217	523
	normaler-weise	32	38	61	41	172
	ab und zu	10	20	17	8	55
	selten	6	5	4	2	17
	nie	5	2	1	1	9
Total		100	158	249	269	776

**Noch ein paar generelle Fragen
zu Ihrem Einkaufs- und Konsumverhalten. Welche der genannten Verhaltensweisen treffen auf Sie zu? -
Recycling von Batterien und elektrische Geräten * AGE GROUPS Crosstabulation**

Count

		AGE GROUPS				Total
		18 - 24	25 - 34	35 - 49	50 - 64	
Noch ein paar generelle Fragen zu Ihrem Einkaufs- und Konsumverhalten. Welche der genannten Verhaltensweisen treffen auf Sie zu? - Recycling von Batterien und elektrische Geräten	immer	46	87	155	198	486
	normaler-weise	22	45	55	45	167
	ab und zu	21	18	29	18	86
	selten	8	8	6	2	24
	nie	3	0	4	6	13
Total		100	158	249	269	776

**Noch ein paar generelle Fragen
zu Ihrem Einkaufs- und Konsumverhalten. Welche der genannten Verhaltensweisen treffen auf Sie zu? -
Recycling von leere Flaschen * AGE GROUPS Crosstabulation**

Count

		AGE GROUPS				Total
		18 - 24	25 - 34	35 - 49	50 - 64	
Noch ein paar generelle Fragen zu Ihrem Einkaufs- und Konsumverhalten. Welche der genannten Verhaltensweisen treffen auf Sie zu? - Recycling von leere Flaschen	immer	72	120	188	234	614
	normaler-weise	13	23	43	27	106
	ab und zu	7	9	15	6	37
	selten	2	5	1	0	8
	nie	6	1	2	2	11
Total		100	158	249	269	776

**Noch ein paar generelle Fragen
zu Ihrem Einkaufs- und Konsumverhalten. Welche der genannten Verhaltensweisen treffen auf Sie zu? -
Recycling von Kunststoff und Metall * AGE GROUPS Crosstabulation**

Count

		AGE GROUPS				Total
		18 - 24	25 - 34	35 - 49	50 - 64	
Noch ein paar generelle Fragen zu Ihrem Einkaufs- und Konsumverhalten. Welche der genannten Verhaltensweisen treffen auf Sie zu? - Recycling von Kunststoff und Metall	immer	36	91	171	208	506
	normaler-weise	39	46	52	45	182
	ab und zu	10	12	18	7	47
	selten	8	5	4	4	21
	nie	7	4	4	5	20
Total		100	158	249	269	776

**Noch ein paar generelle Fragen
zu Ihrem Einkaufs- und Konsumverhalten. Welche der genannten Verhaltensweisen treffen auf Sie zu? -
Mülltrennung * AGE GROUPS Crosstabulation**

Count

		AGE GROUPS				Total
		18 - 24	25 - 34	35 - 49	50 - 64	
Noch ein paar generelle Fragen zu Ihrem Einkaufs- und Konsumverhalten. Welche der genannten Verhaltensweisen treffen auf Sie zu? - Mülltrennung	immer	79	101	186	222	588
	normaler-weise	12	43	45	35	135
	ab und zu	6	9	10	6	31
	selten	2	5	5	5	17
	nie	1	0	3	1	5
Total		100	158	249	269	776

**Noch ein paar generelle Fragen
zu Ihrem Einkaufs- und Konsumverhalten. Welche der genannten Verhaltensweisen treffen auf Sie zu? - Ich kaufe
lokale/regionale Lebensmittel * AGE GROUPS Crosstabulation**

Count

		AGE GROUPS				Total
		18 - 24	25 - 34	35 - 49	50 - 64	
Noch ein paar generelle Fragen zu Ihrem Einkaufs- und Konsumverhalten. Welche der genannten Verhaltensweisen treffen auf Sie zu? - Ich kaufe lokale/regionale Lebensmittel	immer	16	21	20	48	105
	normaler-weise	36	79	124	122	361
	ab und zu	31	51	87	83	252
	selten	13	7	15	14	49
	nie	4	0	3	2	9
Total		100	158	249	269	776

**Noch ein paar generelle Fragen
zu Ihrem Einkaufs- und Konsumverhalten. Welche der genannten Verhaltensweisen treffen auf Sie zu? - Ich kaufe
Bio-Lebensmittel * AGE GROUPS Crosstabulation**

Count

		AGE GROUPS				Total
		18 - 24	25 - 34	35 - 49	50 - 64	
Noch ein paar generelle Fragen zu Ihrem Einkaufs- und Konsumverhalten. Welche der genannten Verhaltensweisen treffen auf Sie zu? - Ich kaufe Bio-Lebensmittel	immer	11	7	17	20	55
	normaler-weise	30	66	64	57	217
	ab und zu	34	53	106	112	305
	selten	22	21	34	50	127
	nie	3	11	28	30	72
Total		100	158	249	269	776

**Noch ein paar generelle Fragen
zu Ihrem Einkaufs- und Konsumverhalten. Welche der genannten Verhaltensweisen treffen auf Sie zu? -
Berücksichtigung der Verpackung eines Produkts (ich bevorzuge recyceltes Material, unverpacktes Obst und
Gemüse,…) * AGE GROUPS Crosstabulation**

Count

		AGE GROUPS				Total
		18 - 24	25 - 34	35 - 49	50 - 64	
Noch ein paar generelle Fragen zu Ihrem Einkaufs- und Konsumverhalten. Welche der genannten Verhaltensweisen treffen auf Sie zu? - Berücksichtigung der Verpackung eines Produkts (ich bevorzuge recyceltes Material, unverpacktes Obst und Gemüse,…)	immer	21	29	34	47	131
	normaler-weise	44	68	122	120	354
	ab und zu	29	50	60	75	214
	selten	3	7	16	18	44
	nie	3	4	17	9	33
Total		100	158	249	269	776

A.13 Descriptive statistics question 20 and 21 / Gender

Wie oft nutzen Sie die folgenden Verkehrsmittel? - Nutzung des Fahrrades oder zu Fuß gehen, wann immer dies möglich ist * Ein paar Fragen zu Ihrer Person. Sind Sie ... Crosstabulation

Count

		Ein paar Fragen zu Ihrer Person. Sind Sie ...			Total
		weiblich	männlich	divers	
Wie oft nutzen Sie die folgenden Verkehrsmittel? - Nutzung des Fahrrades oder zu Fuß gehen, wann immer dies möglich ist	oft	240	238	0	478
	gelegentlich	124	126	1	251
	nie	36	26	0	62
Total		400	390	1	791

Wie oft nutzen Sie die folgenden Verkehrsmittel? - Nutzung von öffentlichen Verkehrsmitteln * Ein paar Fragen zu Ihrer Person. Sind Sie ... Crosstabulation

Count

		Ein paar Fragen zu Ihrer Person. Sind Sie ...			Total
		weiblich	männlich	divers	
Wie oft nutzen Sie die folgenden Verkehrsmittel? - Nutzung von öffentlichen Verkehrsmitteln	oft	103	98	1	202
	gelegentlich	147	180	0	327
	nie	150	112	0	262
Total		400	390	1	791

Wie oft nutzen Sie die folgenden Verkehrsmittel? - Nutzung von Car Sharing/Car-Pooling * Ein paar Fragen zu Ihrer Person. Sind Sie ... Crosstabulation

Count

		Ein paar Fragen zu Ihrer Person. Sind Sie ...			Total
		weiblich	männlich	divers	
Wie oft nutzen Sie die folgenden Verkehrsmittel? - Nutzung von Car Sharing/Car-Pooling	oft	13	11	0	24
	gelegentlich	46	57	0	103
	nie	341	322	1	664
Total		400	390	1	791

Noch ein paar generelle Fragen zu Ihrem Einkaufs- und Konsumverhalten. Welche der genannten Verhaltensweisen treffen auf Sie zu? - Energie sparen (z.B. Ausschalten des Lichtes, wenn ich den Raum verlasse) * Ein paar Fragen zu Ihrer Person. Sind Sie ... Crosstabulation

Count

		Ein paar Fragen zu Ihrer Person. Sind Sie ...			Total
		weiblich	männlich	divers	
Noch ein paar generelle Fragen zu Ihrem Einkaufs- und Konsumverhalten. Welche der genannten Verhaltensweisen treffen auf Sie zu? - Energie sparen (z.B. Ausschalten des Lichtes, wenn ich den Raum verlasse)	immer	244	224	0	468
	normaler-weise	129	134	1	264
	ab und zu	23	29	0	52
	selten	4	3	0	7
Total		400	390	1	791

Noch ein paar generelle Fragen zu Ihrem Einkaufs- und Konsumverhalten. Welche der genannten Verhaltensweisen treffen auf Sie zu? - Einkauf von energiefreundlichen und / oder energieeffizienten Produkten (energieeffiziente Haushaltsgeräte, energieeffiziente Glühbirnen,…) * Ein paar Fragen zu Ihrer Person. Sind Sie ... Crosstabulation

Count

		Ein paar Fragen zu Ihrer Person. Sind Sie ...			Total
		weiblich	männlich	divers	
Noch ein paar generelle Fragen zu Ihrem Einkaufs- und Konsumverhalten. Welche der genannten Verhaltensweisen treffen auf Sie zu? - Einkauf von energiefreundlichen und / oder energieeffizienten Produkten (energieeffiziente Haushaltsgeräte, energieeffiziente Glühbirnen,…)	immer	163	160	0	323
	normaler-weise	180	166	1	347
	ab und zu	51	53	0	104
	selten	5	7	0	12
	nie	1	4	0	5
Total		400	390	1	791

Noch ein paar generelle Fragen zu Ihrem Einkaufs- und Konsumverhalten. Welche der genannten Verhaltensweisen treffen auf Sie zu? - Umweltbewusster Wasserverbrauch (kurz duschen, Waschmaschine / Geschirrspüler vor dem Start vollständig füllen) * Ein paar Fragen zu Ihrer Person. Sind Sie ... Crosstabulation

Count

		Ein paar Fragen zu Ihrer Person. Sind Sie ...			Total
		weiblich	männlich	divers	
Noch ein paar generelle Fragen zu Ihrem Einkaufs- und Konsumverhalten. Welche der genannten Verhaltensweisen treffen auf Sie zu? - Umweltbewusster Wasserverbrauch (kurz duschen, Waschmaschine / Geschirrspüler vor dem Start vollständig füllen)	immer	204	159	0	363
	normaler-weise	144	170	1	315
	ab und zu	43	46	0	89
	selten	8	12	0	20
	nie	1	3	0	4
Total		400	390	1	791

Noch ein paar generelle Fragen zu Ihrem Einkaufs- und Konsumverhalten. Welche der genannten Verhaltensweisen treffen auf Sie zu? - Recycling von Papier * Ein paar Fragen zu Ihrer Person. Sind Sie ... Crosstabulation

Count

		Ein paar Fragen zu Ihrer Person. Sind Sie ...			Total
		weiblich	männlich	divers	
Noch ein paar generelle Fragen zu Ihrem Einkaufs- und Konsumverhalten. Welche der genannten Verhaltensweisen treffen auf Sie zu? - Recycling von Papier	immer	263	263	1	527
	normaler-weise	89	89	0	178
	ab und zu	34	25	0	59
	selten	9	9	0	18
	nie	5	4	0	9
Total		400	390	1	791

Noch ein paar generelle Fragen zu Ihrem Einkaufs- und Konsumverhalten. Welche der genannten Verhaltensweisen treffen auf Sie zu? - Recycling von Batterien und elektrische Geräten * Ein paar Fragen zu Ihrer Person. Sind Sie ... Crosstabulation

Count

		Ein paar Fragen zu Ihrer Person. Sind Sie ...			Total
		weiblich	männlich	divers	
Noch ein paar generelle Fragen zu Ihrem Einkaufs- und Konsumverhalten. Welche der genannten Verhaltensweisen treffen auf Sie zu? - Recycling von Batterien und elektrische Geräten	immer	248	245	1	494
	normaler-weise	81	90	0	171
	ab und zu	46	41	0	87
	selten	17	9	0	26
	nie	8	5	0	13
Total		400	390	1	791

Noch ein paar generelle Fragen zu Ihrem Einkaufs- und Konsumverhalten. Welche der genannten Verhaltensweisen treffen auf Sie zu? - Recycling von leere Flaschen * Ein paar Fragen zu Ihrer Person. Sind Sie ... Crosstabulation

Count

		Ein paar Fragen zu Ihrer Person. Sind Sie ...			Total
		weiblich	männlich	divers	
Noch ein paar generelle Fragen zu Ihrem Einkaufs- und Konsumverhalten. Welche der genannten Verhaltensweisen treffen auf Sie zu? - Recycling von leere Flaschen	immer	328	296	1	625
	normaler-weise	46	62	0	108
	ab und zu	15	23	0	38
	selten	6	3	0	9
	nie	5	6	0	11
Total		400	390	1	791

Noch ein paar generelle Fragen zu Ihrem Einkaufs- und Konsumverhalten. Welche der genannten Verhaltensweisen treffen auf Sie zu? - Recycling von Kunststoff und Metall * Ein paar Fragen zu Ihrer Person. Sind Sie ... Crosstabulation

Count

		Ein paar Fragen zu Ihrer Person. Sind Sie ...			Total
		weiblich	männlich	divers	
Noch ein paar generelle Fragen zu Ihrem Einkaufs- und Konsumverhalten. Welche der genannten Verhaltensweisen treffen auf Sie zu? - Recycling von Kunststoff und Metall	immer	255	256	0	511
	normaler-weise	92	95	1	188
	ab und zu	27	21	0	48
	selten	15	9	0	24
	nie	11	9	0	20
Total		400	390	1	791

Noch ein paar generelle Fragen
zu Ihrem Einkaufs- und Konsumverhalten. Welche der genannten Verhaltensweisen treffen auf Sie zu? -
Mülltrennung * Ein paar Fragen zu Ihrer Person. Sind Sie ... Crosstabulation

Count

		Ein paar Fragen zu Ihrer Person. Sind Sie ...			Total
		weiblich	männlich	divers	
Noch ein paar generelle Fragen zu Ihrem Einkaufs- und Konsumverhalten. Welche der genannten Verhaltensweisen treffen auf Sie zu? - Mülltrennung	immer	305	292	0	597
	normaler-weise	64	73	1	138
	ab und zu	15	19	0	34
	selten	12	5	0	17
	nie	4	1	0	5
Total		400	390	1	791

Noch ein paar generelle Fragen
zu Ihrem Einkaufs- und Konsumverhalten. Welche der genannten Verhaltensweisen treffen auf Sie zu? - Ich
kaufe lokale/regionale Lebensmittel * Ein paar Fragen zu Ihrer Person. Sind Sie ... Crosstabulation

Count

		Ein paar Fragen zu Ihrer Person. Sind Sie ...			Total
		weiblich	männlich	divers	
Noch ein paar generelle Fragen zu Ihrem Einkaufs- und Konsumverhalten. Welche der genannten Verhaltensweisen treffen auf Sie zu? - Ich kaufe lokale/regionale Lebensmittel	immer	56	50	0	106
	normaler-weise	188	179	0	367
	ab und zu	126	130	1	257
	selten	25	27	0	52
	nie	5	4	0	9
Total		400	390	1	791

Noch ein paar generelle Fragen
zu Ihrem Einkaufs- und Konsumverhalten. Welche der genannten Verhaltensweisen treffen auf Sie zu? - Ich
kaufe Bio-Lebensmittel * Ein paar Fragen zu Ihrer Person. Sind Sie ... Crosstabulation

Count

		Ein paar Fragen zu Ihrer Person. Sind Sie ...			Total
		weiblich	männlich	divers	
Noch ein paar generelle Fragen zu Ihrem Einkaufs- und Konsumverhalten. Welche der genannten Verhaltensweisen treffen auf Sie zu? - Ich kaufe Bio-Lebensmittel	immer	30	25	0	55
	normaler-weise	110	115	0	225
	ab und zu	174	134	1	309
	selten	54	74	0	128
	nie	32	42	0	74
Total		400	390	1	791

Noch ein paar generelle Fragen
zu Ihrem Einkaufs- und Konsumverhalten. Welche der genannten Verhaltensweisen treffen auf Sie zu? -
Berücksichtigung der Verpackung eines Produkts (ich bevorzuge recyceltes Material, unverpacktes Obst
und Gemüse,…) * Ein paar Fragen zu Ihrer Person. Sind Sie ... Crosstabulation

Count

		Ein paar Fragen zu Ihrer Person. Sind Sie ...			Total
		weiblich	männlich	divers	
Noch ein paar generelle Fragen zu Ihrem Einkaufs- und Konsumverhalten. Welche der genannten Verhaltensweisen treffen auf Sie zu? - Berücksichtigung der Verpackung eines Produkts (ich bevorzuge recyceltes Material, unverpacktes Obst und Gemüse,…)	immer	83	52	0	135
	normaler-weise	179	181	1	361
	ab und zu	106	111	0	217
	selten	19	26	0	45
	nie	13	20	0	33
Total		400	390	1	791

Noch ein paar generelle Fragen
zu Ihrem Einkaufs- und Konsumverhalten. Welche der genannten Verhaltensweisen treffen auf Sie zu? -
Nutzung von eigenen/mitgebrachten Taschen beim Einkauf * Ein paar Fragen zu Ihrer Person. Sind Sie ...
Crosstabulation

Count

		Ein paar Fragen zu Ihrer Person. Sind Sie ...			Total
		weiblich	männlich	divers	
Noch ein paar generelle Fragen zu Ihrem Einkaufs- und Konsumverhalten. Welche der genannten Verhaltensweisen treffen auf Sie zu? - Nutzung von eigenen/mitgebrachten Taschen beim Einkauf	immer	283	218	1	502
	normaler-weise	85	116	0	201
	ab und zu	23	42	0	65
	selten	8	12	0	20
	nie	1	2	0	3
Total		400	390	1	791

Noch ein paar generelle Fragen
zu Ihrem Einkaufs- und Konsumverhalten. Welche der genannten Verhaltensweisen treffen auf Sie zu? - Ich
unterhalte mich mit Freunden über die Umweltsituation und die damit verbundenen Probleme * Ein paar
Fragen zu Ihrer Person. Sind Sie ... Crosstabulation

Count

		Ein paar Fragen zu Ihrer Person. Sind Sie ...			Total
		weiblich	männlich	divers	
Noch ein paar generelle Fragen zu Ihrem Einkaufs- und Konsumverhalten. Welche der genannten Verhaltensweisen treffen auf Sie zu? - Ich unterhalte mich mit Freunden über die Umweltsituation und die damit verbundenen Probleme	immer	71	48	0	119
	normaler-weise	116	127	1	244
	ab und zu	129	121	0	250
	selten	58	59	0	117
	nie	26	35	0	61
Total		400	390	1	791

Noch ein paar generelle Fragen
zu Ihrem Einkaufs- und Konsumverhalten. Welche der genannten Verhaltensweisen treffen auf Sie zu? - Ich
weise andere darauf hin, wenn ich unökologisches Verhalten beobachte * Ein paar Fragen zu Ihrer Person.
Sind Sie ... Crosstabulation

Count

		Ein paar Fragen zu Ihrer Person. Sind Sie ...			Total
		weiblich	männlich	divers	
Noch ein paar generelle Fragen zu Ihrem Einkaufs- und Konsumverhalten. Welche der genannten Verhaltensweisen treffen auf Sie zu? - Ich weise andere darauf hin, wenn ich unökologisches Verhalten beobachte	immer	37	35	0	72
	normaler-weise	92	94	0	186
	ab und zu	112	111	1	224
	selten	85	81	0	166
	nie	74	69	0	143
Total		400	390	1	791

Noch ein paar generelle Fragen
zu Ihrem Einkaufs- und Konsumverhalten. Welche der genannten Verhaltensweisen treffen auf Sie zu? - Ich
kaufe keine Produkte von Unternehmen, die für eine nicht-ökologische Arbeitspraxis bekannt sind * Ein
paar Fragen zu Ihrer Person. Sind Sie ... Crosstabulation

Count

		Ein paar Fragen zu Ihrer Person. Sind Sie ...			Total
		weiblich	männlich	divers	
Noch ein paar generelle Fragen zu Ihrem Einkaufs- und Konsumverhalten. Welche der genannten Verhaltensweisen treffen auf Sie zu? - Ich kaufe keine Produkte von Unternehmen, die für eine nicht-ökologische Arbeitspraxis bekannt sind	immer	37	38	0	75
	normaler-weise	116	107	0	223
	ab und zu	140	130	1	271
	selten	68	70	0	138
	nie	39	45	0	84
Total		400	390	1	791

A.14 Descriptive statistics question 20 and 21 / Education level

Wie oft nutzen Sie die folgenden Verkehrsmittel? - Nutzung des Fahrrades oder zu Fuß gehen, wann immer dies möglich ist * Education Groups Crosstabulation

Count

		Education Groups			
		ISCED 0-2 (keine Schulabschluss, Hauptschule, Mittlere Reife)	ISCED 3-4 (Abitur/Fachabitur, abgeschlossene Berufsausbildung, Fachwirt/Meister)	ISCED 5-8 (Bachelor, Master, MBA, Promotion)	Total
Wie oft nutzen Sie die folgenden Verkehrsmittel? - Nutzung des Fahrrades oder zu Fuß gehen, wann immer dies möglich ist	oft	72	266	139	477
	gelegentlich	42	155	54	251
	nie	9	48	4	61
Total		123	469	197	789

Wie oft nutzen Sie die folgenden Verkehrsmittel? - Nutzung von öffentlichen Verkehrsmitteln * Education Groups Crosstabulation

Count

		Education Groups			
		ISCED 0-2 (keine Schulabschluss, Hauptschule, Mittlere Reife)	ISCED 3-4 (Abitur/Fachabitur, abgeschlossene Berufsausbildung, Fachwirt/Meister)	ISCED 5-8 (Bachelor, Master, MBA, Promotion)	Total
Wie oft nutzen Sie die folgenden Verkehrsmittel? - Nutzung von öffentlichen Verkehrsmitteln	oft	25	106	71	202
	gelegentlich	50	191	84	325
	nie	48	172	42	262
Total		123	469	197	789

Wie oft nutzen Sie die folgenden Verkehrsmittel? - Nutzung von Car Sharing/Car-Pooling * Education Groups Crosstabulation

Count

		Education Groups			
		ISCED 0-2 (keine Schulabschluss, Hauptschule, Mittlere Reife)	ISCED 3-4 (Abitur/Fachabitur, abgeschlossene Berufsausbildung, Fachwirt/Meister)	ISCED 5-8 (Bachelor, Master, MBA, Promotion)	Total
Wie oft nutzen Sie die folgenden Verkehrsmittel? - Nutzung von Car Sharing/Car-Pooling	oft	3	12	9	24
	gelegentlich	12	40	51	103
	nie	108	417	137	662
Total		123	469	197	789

Noch ein paar generelle Fragen zu Ihrem Einkaufs- und Konsumverhalten. Welche der genannten Verhaltensweisen treffen auf Sie zu? - Energie sparen (z.B. Ausschalten des Lichtes, wenn ich den Raum verlasse) * Education Groups Crosstabulation

Count

		Education Groups			
		ISCED 0-2 (keine Schulabschluss, Hauptschule, Mittlere Reife)	ISCED 3-4 (Abitur/Fachabitur, abgeschlossene Berufsausbildung, Fachwirt/Meister)	ISCED 5-8 (Bachelor, Master, MBA, Promotion)	Total
Noch ein paar generelle Fragen zu Ihrem Einkaufs- und Konsumverhalten. Welche der genannten Verhaltensweisen treffen auf Sie zu? - Energie sparen (z.B. Ausschalten des Lichtes, wenn ich den Raum verlasse)	immer	75	290	102	467
	normaler-weise	37	150	77	264
	ab und zu	9	28	15	52
	selten	2	1	3	6
Total		123	469	197	789

Noch ein paar generelle Fragen zu Ihrem Einkaufs- und Konsumverhalten. Welche der genannten Verhaltensweisen treffen auf Sie zu? - Einkauf von energiefreundlichen und / oder energieeffizienten Produkten (energieeffiziente Haushaltsgeräte, energieeffiziente Glühbirnen,…) * Education Groups Crosstabulation

Count

		Education Groups			
		ISCED 0-2 (keine Schulabschluss, Hauptschule, Mittlere Reife)	ISCED 3-4 (Abitur/Fachabitur, abgeschlossene Berufsausbildung, Fachwirt/Meister)	ISCED 5-8 (Bachelor, Master, MBA, Promotion)	Total
Noch ein paar generelle Fragen zu Ihrem Einkaufs- und Konsumverhalten. Welche der genannten Verhaltensweisen treffen auf Sie zu? - Einkauf von energiefreundlichen und / oder energieeffizienten Produkten (energieeffiziente Haushaltsgeräte, energieeffiziente Glühbirnen,…)	immer	43	207	71	321
	normaler-weise	57	188	102	347
	ab und zu	16	66	22	104
	selten	5	5	2	12
	nie	2	3	0	5
Total		123	469	197	789

Noch ein paar generelle Fragen zu Ihrem Einkaufs- und Konsumverhalten. Welche der genannten Verhaltensweisen treffen auf Sie zu? - Umweltbewusster Wasserverbrauch (kurz duschen, Waschmaschine / Geschirrspüler vor dem Start vollständig füllen) * Education Groups Crosstabulation

Count

		Education Groups			
		ISCED 0-2 (keine Schulabschluss, Hauptschule, Mittlere Reife)	ISCED 3-4 (Abitur/Fachabitur, abgeschlossene Berufsausbildung, Fachwirt/Meister)	ISCED 5-8 (Bachelor, Master, MBA, Promotion)	Total
Noch ein paar generelle Fragen zu Ihrem Einkaufs- und Konsumverhalten. Welche der genannten Verhaltensweisen treffen auf Sie zu? - Umweltbewusster Wasserverbrauch (kurz duschen, Waschmaschine / Geschirrspüler vor dem Start vollständig füllen)	immer	54	232	77	363
	normaler-weise	49	179	86	314
	ab und zu	13	43	32	88
	selten	6	12	2	20
	nie	1	3	0	4
Total		123	469	197	789

Noch ein paar generelle Fragen zu Ihrem Einkaufs- und Konsumverhalten. Welche der genannten Verhaltensweisen treffen auf Sie zu? - Recycling von Papier * Education Groups Crosstabulation

Count

		Education Groups			
		ISCED 0-2 (keine Schulabschluss, Hauptschule, Mittlere Reife)	ISCED 3-4 (Abitur/Fachabitur, abgeschlossene Berufsausbildung, Fachwirt/Meister)	ISCED 5-8 (Bachelor, Master, MBA, Promotion)	Total
Noch ein paar generelle Fragen zu Ihrem Einkaufs- und Konsumverhalten. Welche der genannten Verhaltensweisen treffen auf Sie zu? - Recycling von Papier	immer	80	328	119	527
	normaler-weise	30	95	52	177
	ab und zu	7	31	21	59
	selten	4	10	3	17
	nie	2	5	2	9
Total		123	469	197	789

Noch ein paar generelle Fragen zu Ihrem Einkaufs- und Konsumverhalten. Welche der genannten Verhaltensweisen treffen auf Sie zu? - Recycling von Batterien und elektrische Geräten * Education Groups Crosstabulation

Count

		Education Groups			
		ISCED 0-2 (keine Schulabschluss, Hauptschule, Mittlere Reife)	ISCED 3-4 (Abitur/Fachabitur, abgeschlossene Berufsausbildung, Fachwirt/Meister)	ISCED 5-8 (Bachelor, Master, MBA, Promotion)	Total
Noch ein paar generelle Fragen zu Ihrem Einkaufs- und Konsumverhalten. Welche der genannten Verhaltensweisen treffen auf Sie zu? - Recycling von Batterien und elektrische Geräten	immer	79	299	115	493
	normaler-weise	21	105	45	171
	ab und zu	17	46	24	87
	selten	4	10	11	25
	nie	2	9	2	13
Total		123	469	197	789

Noch ein paar generelle Fragen zu Ihrem Einkaufs- und Konsumverhalten. Welche der genannten Verhaltensweisen treffen auf Sie zu? - Recycling von leere Flaschen * Education Groups Crosstabulation

Count

		Education Groups			
		ISCED 0-2 (keine Schulabschluss, Hauptschule, Mittlere Reife)	ISCED 3-4 (Abitur/Fachabitur, abgeschlossene Berufsausbildung, Fachwirt/Meister)	ISCED 5-8 (Bachelor, Master, MBA, Promotion)	Total
Noch ein paar generelle Fragen zu Ihrem Einkaufs- und Konsumverhalten. Welche der genannten Verhaltensweisen treffen auf Sie zu? - Recycling von leere Flaschen	immer	96	382	145	623
	normaler-weise	16	61	31	108
	ab und zu	6	18	14	38
	selten	2	2	5	9
	nie	3	6	2	11
Total		123	469	197	789

Noch ein paar generelle Fragen zu Ihrem Einkaufs- und Konsumverhalten. Welche der genannten Verhaltensweisen treffen auf Sie zu? - Recycling von Kunststoff und Metall * Education Groups Crosstabulation

Count

		Education Groups			
		ISCED 0-2 (keine Schulabschluss, Hauptschule, Mittlere Reife)	ISCED 3-4 (Abitur/Fachabitur, abgeschlossene Berufsausbildung, Fachwirt/Meister)	ISCED 5-8 (Bachelor, Master, MBA, Promotion)	Total
Noch ein paar generelle Fragen zu Ihrem Einkaufs- und Konsumverhalten. Welche der genannten Verhaltensweisen treffen auf Sie zu? - Recycling von Kunststoff und Metall	immer	76	322	113	511
	normaler-weise	26	106	56	188
	ab und zu	9	21	17	47
	selten	7	11	5	23
	nie	5	9	6	20
Total		123	469	197	789

Noch ein paar generelle Fragen zu Ihrem Einkaufs- und Konsumverhalten. Welche der genannten Verhaltensweisen treffen auf Sie zu? - Mülltrennung * Education Groups Crosstabulation

Count

		Education Groups			
		ISCED 0-2 (keine Schulabschluss, Hauptschule, Mittlere Reife)	ISCED 3-4 (Abitur/Fachabitur, abgeschlossene Berufsausbildung, Fachwirt/Meister)	ISCED 5-8 (Bachelor, Master, MBA, Promotion)	Total
Noch ein paar generelle Fragen zu Ihrem Einkaufs- und Konsumverhalten. Welche der genannten Verhaltensweisen treffen auf Sie zu? - Mülltrennung	immer	98	360	139	597
	normaler-weise	19	77	41	137
	ab und zu	3	21	9	33
	selten	2	8	7	17
	nie	1	3	1	5
Total		123	469	197	789

Noch ein paar generelle Fragen zu Ihrem Einkaufs- und Konsumverhalten. Welche der genannten Verhaltensweisen treffen auf Sie zu? - Ich kaufe lokale/regionale Lebensmittel * Education Groups Crosstabulation

Count

		Education Groups			
		ISCED 0-2 (keine Schulabschluss, Hauptschule, Mittlere Reife)	ISCED 3-4 (Abitur/Fachabitur, abgeschlossene Berufsausbildung, Fachwirt/Meister)	ISCED 5-8 (Bachelor, Master, MBA, Promotion)	Total
Noch ein paar generelle Fragen zu Ihrem Einkaufs- und Konsumverhalten. Welche der genannten Verhaltensweisen treffen auf Sie zu? - Ich kaufe lokale/regionale Lebensmittel	immer	10	73	23	106
	normaler-weise	54	211	101	366
	ab und zu	48	150	59	257
	selten	10	30	11	51
	nie	1	5	3	9
Total		123	469	197	789

Noch ein paar generelle Fragen zu Ihrem Einkaufs- und Konsumverhalten. Welche der genannten Verhaltensweisen treffen auf Sie zu? - Ich kaufe Bio-Lebensmittel * Education Groups Crosstabulation

Count

		Education Groups			
		ISCED 0-2 (keine Schulabschluss, Hauptschule, Mittlere Reife)	ISCED 3-4 (Abitur/Fachabitur, abgeschlossene Berufsausbildung, Fachwirt/Meister)	ISCED 5-8 (Bachelor, Master, MBA, Promotion)	Total
Noch ein paar generelle Fragen zu Ihrem Einkaufs- und Konsumverhalten. Welche der genannten Verhaltensweisen treffen auf Sie zu? - Ich kaufe Bio-Lebensmittel	immer	6	36	13	55
	normaler-weise	28	113	84	225
	ab und zu	47	184	77	308
	selten	26	90	11	127
	nie	16	46	12	74
Total		123	469	197	789

Noch ein paar generelle Fragen zu Ihrem Einkaufs- und Konsumverhalten. Welche der genannten Verhaltensweisen treffen auf Sie zu? - Berücksichtigung der Verpackung eines Produkts (ich bevorzuge recyceltes Material, unverpacktes Obst und Gemüse,...) * Education Groups Crosstabulation

Count

		Education Groups			
		ISCED 0-2 (keine Schulabschluss, Hauptschule, Mittlere Reife)	ISCED 3-4 (Abitur/Fachabitur, abgeschlossene Berufsausbildung, Fachwirt/Meister)	ISCED 5-8 (Bachelor, Master, MBA, Promotion)	Total
Noch ein paar generelle Fragen zu Ihrem Einkaufs- und Konsumverhalten. Welche der genannten Verhaltensweisen treffen auf Sie zu? - Berücksichtigung der Verpackung eines Produkts (ich bevorzuge recyceltes Material, unverpacktes Obst und Gemüse,...)	immer	20	75	40	135
	normaler-weise	48	208	103	359
	ab und zu	42	131	44	217
	selten	4	34	7	45
	nie	9	21	3	33
Total		123	469	197	789

Noch ein paar generelle Fragen zu Ihrem Einkaufs- und Konsumverhalten. Welche der genannten Verhaltensweisen treffen auf Sie zu? - Nutzung von eigenen/mitgebrachten Taschen beim Einkauf * Education Groups Crosstabulation

Count

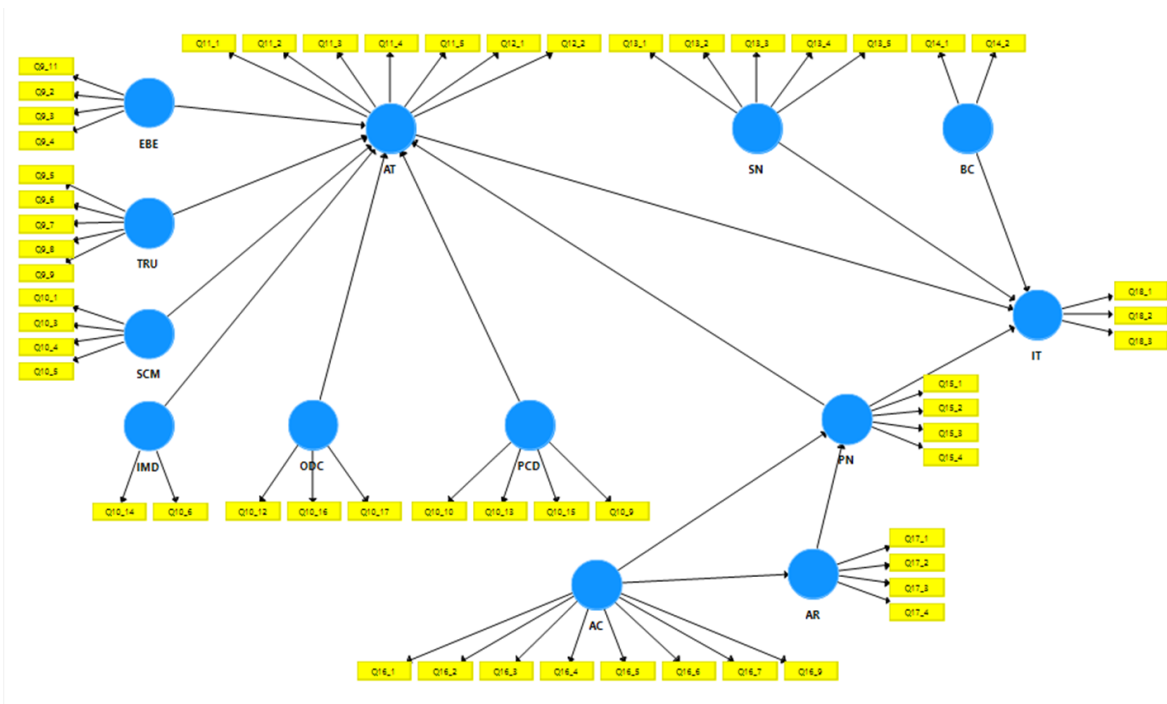|		Education Groups			
		ISCED 0-2 (keine Schulabschluss, Hauptschule, Mittlere Reife)	ISCED 3-4 (Abitur/Fachabitur, abgeschlossene Berufsausbildung, Fachwirt/Meister)	ISCED 5-8 (Bachelor, Master, MBA, Promotion)	Total
Noch ein paar generelle Fragen zu Ihrem Einkaufs- und Konsumverhalten. Welche der genannten Verhaltensweisen treffen auf Sie zu? - Nutzung von eigenen/mitgebrachten Taschen beim Einkauf	immer	80	307	114	501
	normaler-weise	28	110	62	200
	ab und zu	11	40	14	65
	selten	4	10	6	20
	nie	0	2	1	3
Total		123	469	197	789

Noch ein paar generelle Fragen zu Ihrem Einkaufs- und Konsumverhalten. Welche der genannten Verhaltensweisen treffen auf Sie zu? - Ich unterhalte mich mit Freunden über die Umweltsituation und die damit verbundenen Probleme * Education Groups Crosstabulation

Count

		Education Groups			
		ISCED 0-2 (keine Schulabschluss, Hauptschule, Mittlere Reife)	ISCED 3-4 (Abitur/Fachabitur, abgeschlossene Berufsausbildung, Fachwirt/Meister)	ISCED 5-8 (Bachelor, Master, MBA, Promotion)	Total
Noch ein paar generelle Fragen zu Ihrem Einkaufs- und Konsumverhalten. Welche der genannten Verhaltensweisen treffen auf Sie zu? - Ich unterhalte mich mit Freunden über die Umweltsituation und die damit verbundenen Probleme	immer	17	58	44	119
	normaler-weise	34	132	78	244
	ab und zu	36	161	53	250
	selten	24	78	14	116
	nie	12	40	8	60
Total		123	469	197	789

Noch ein paar generelle Fragen zu Ihrem Einkaufs- und Konsumverhalten. Welche der genannten Verhaltensweisen treffen auf Sie zu? - Ich weise andere darauf hin, wenn ich unökologisches Verhalten beobachte * Education Groups Crosstabulation

Count

		Education Groups			
		ISCED 0-2 (keine Schulabschluss, Hauptschule, Mittlere Reife)	ISCED 3-4 (Abitur/Fachabitur, abgeschlossene Berufsausbildung, Fachwirt/Meister)	ISCED 5-8 (Bachelor, Master, MBA, Promotion)	Total
Noch ein paar generelle Fragen zu Ihrem Einkaufs- und Konsumverhalten. Welche der genannten Verhaltensweisen treffen auf Sie zu? - Ich weise andere darauf hin, wenn ich unökologisches Verhalten beobachte	immer	9	37	26	72
	normaler-weise	29	101	56	186
	ab und zu	34	133	56	223
	selten	25	105	36	166
	nie	26	93	23	142
Total		123	469	197	789

A.15 Research Model

A.16 Questionnaire - German

Consumer contribution to CO2 emission reduction (German Version)

Start of Block: Screening

JS

Q1 Screening 1: **Konsumiert mindestens eine Person in Ihrem Haushalt Milchprodukte wie zum Beispiel Milch, Joghurt, Käse?**
Ja (1)
Nein (2)

Skip To: End of Block If Screening 1: Konsumiert mindestens eine Person in Ihrem Haushalt Milchprodukte wie zum Beispiel M... = Nein

Q2 Screening 2: **Sind Sie in Ihrem Haushalt für den Einkauf von täglich benötigten Lebensmitteln verantwortlich oder mitverantwortlich?**
Ja (1)
Nein (2)

Skip To: End of Block If Screening 2: Sind Sie in Ihrem Haushalt für den Einkauf von täglich benötigten Lebensmitteln vera... = Nein

End of Block: Screening

Start of Block: Quotas

Q3 **Ein paar Fragen zu Ihrer Person. Sind Sie ...**
weiblich (1)
männlich (2)
divers (3)

Page Break

X→

Q4 **Könnten Sie bitte Ihr Alter angeben.**
Ich bin ... Jahre alt. (1)
Möchte ich nicht angeben (99)

Page Break

X→

Q5 **Welchen höchsten Bildungsstand haben Sie?**
Keinen Schulabschluss (1)
Hauptschulabschluss/Mittlere Reife (2)
Abitur/Fachabitur (3)
Abgeschlossene Berufsausbildung (4)
Fachwirt/ Meister (5)
Bachelor (6)
Diplom/ Magister/ Master (7)
MBA (8)
Promotion, Habilitation (9)
Möchte ich nicht angeben   (99)

End of Block: Quotas

Start of Block: Introduction/warm-up
Page Break

Q6
Liebe(r) Studienteilnehmer(in), zunehmend arbeiten Firmen mit Nachhaltigkeitsstrategien, auch in der Lebensmittelindustrie. Diese Studie ist eine wissenschaftliche Untersuchung in Zusammenarbeit zwischen der Kingston Universität in London und der Industrie. Ziel der Studie ist es, Sie als Verbraucher von Milchprodukten besser kennen zu lernen. Wir schätzen Ihre Teilnahme an diesem interessanten Thema, das uns alle betrifft, sehr. Es gibt keine richtigen oder falschen Antworten auf die gestellten Fragen. Bitte antworten Sie **spontan** entsprechend Ihrer persönlichen Meinung und Ihren Gefühlen, wenn Sie die Fragen und Aussagen lesen. Wir können nur dann zielführende Empfehlungen für die Industrie erarbeiten, **wenn wir Ihre eigene und ehrliche Meinung** zu den gestellten Fragen erhalten. *Bitte kreuzen Sie das Kästchen an, das Ihre Meinung zu jeder der einzelnen Aussagen am besten widerspiegelt. **Bitte lesen Sie sich die Aussagen ganz genau durch.** Bitte gehen sie bei der Beantwortung der Fragen **von Ihrem typischen Einkaufsverhalten beim Kauf von Lebensmitteln**, besonders beim **Einkauf von gängigen Milchprodukten wie Joghurt, Käse und Milch aus**.*

Page Break

Q7 **Gibt es Lebensmittel, bei denen Sie beim Einkauf besonders auf den CO2-Ausstoß achten? Nennen** Sie gerne auch andere Produkte als Milchprodukte. *Bitte nennen Sie diese Lebensmittel (mehrere Nennungen möglich).*

_____

Page Break

Q8 **Hat sich für Sie die Berücksichtigung des CO2-Ausstoßes beim Kauf Ihrer täglichen Lebensmittel durch die derzeitige COVID 19 Pandemie verändert?**

Ja, ich beziehe CO2-Ausstoß-Informationen stärker ein. (1)
Ja, ich beziehe CO2-Ausstoß weniger ein. (2)
Nein, ist gleich geblieben (3)

Page Break

End of Block: Introduction/warm-up

Start of Block: Reasons for and against

Q9 **Wenn es Unternehmen gäbe, die auf CO2-Ausstoß-Reduktion bei der Produktion von Milchprodukten achten, welche Gründe würden dann für Sie <u>für den Kauf</u> dieser Milchprodukte sprechen? Bitte lesen Sie die Aussagen genau durch.** *Bitte wählen Sie nur "trifft voll und ganz zu", "trifft eher zu", wenn es für Sie <u>ein wirklicher Grund</u> ist. Bitte unterscheiden Sie auch zwischen "trifft voll und ganz*

zu" und "trifft eher zu". Sollte es für Sie kein Grund sein, wählen Sie "trifft nicht zu".

Ich kaufe Milchprodukte von Unternehmen, die den CO2-**Ausstoß** reduzieren, ...

	trifft voll und ganz zu (1)	trifft eher zu (2)	trifft nicht zu (3)
... weil auch mein persönlicher Einkauf positive Auswirkungen auf den CO2-Ausstoß hat. (20)			
... weil jeder Lebensmitteleinkauf hilft, den CO2-Ausstoß global zu reduzieren. (21)			
... weil auch die Reduktion des CO2-Ausstoßes in der Milchindustrie gut für die nächsten Generationen ist. (22)			
... weil ein geringerer CO2-Ausstoß der Milchindustrie meinen lokalen Lebensraum verbessert. (23)			
... weil ich generell Bio-Produkte und lokale Produkte kaufe und davon ausgehe, dass diese unter Berücksichtigung des CO2-Ausstoßes hergestellt werden. (24)			
... weil ich darauf vertraue, dass die Marken, die ich kaufe, den CO2-Ausstoß bei der Produktion reduzieren. (25)			
... weil die Ware mit einem Umweltsiegel, das auf den CO2-Ausstoß hinweist, gekennzeichnet ist. (26)			
... weil ich bekannte Marken kaufe, da ich glaube, dass diese eher die Möglichkeit und die Verpflichtung haben, in die CO2-Ausstoß-Reduktion zu investieren. (27)			
... weil ich mir generell Zeit für die Auswahl von nachhaltig produzierten Lebensmitteln nehme. (28)			
... weil ich teure Milchprodukte kaufe, denn da bin ich sicher, dass der CO2-Ausstoß beachtet wird. (31)			
... weil, wenn wir alle Milchprodukte von Unternehmen kaufen, die den CO2-Ausstoß reduzieren, immer mehr Unternehmen diese anbieten werden und somit etwas für die Umwelt tun. (40)			
Bitte kreuzen Sie "trifft voll und ganz zu" an. (41)			

Skip To: End of Block If Wenn es Unternehmen gäbe, die auf CO2-Ausstoß-Reduktion bei der Produktion von Milchprodukten ach... != Bitte kreuzen Sie "trifft voll und ganz zu" an. [trifft voll und ganz zu]

Page Break

Q10 **Wenn es Unternehmen gäbe, die auf die CO2-Ausstoß-Reduktion bei der Produktion von Milchprodukten achten, welche Gründe würden für Sie gegen den Kauf sprechen?** Bitte lesen Sie genau und wählen Sie nur "trifft voll und ganz zu", "trifft eher zu", wenn das Statement für Sie <u>ein wirklicher Grund gegen die Einbeziehung von CO2-Ausstoß Informationen</u> ist. Bitte unterscheiden Sie auch klar zwischen "trifft voll und ganz zu" und "trifft eher zu". Sollte es für Sie kein Grund

sein, wählen Sie "trifft nicht zu".   Ich berücksichtige Informationen zur CO2-**Ausstoß**-Reduktion der Unternehmen der Milchindustrie <u>nicht</u>, ...

	trifft voll und ganz zu (1)	trifft eher zu (2)	trifft nicht zu (3)
...weil mein persönlicher Einkauf von Milchprodukten <u>keine</u> Auswirkung auf die CO2-Ausstoß-Reduktion hat. (1)			
... weil ich <u>keine Molkerei kenne</u>, die einen reduzierten CO2-Ausstoß angibt. (2)			
... weil ich <u>nicht glaube</u>, dass es eine Molkerei gibt, die die Produktionsmethode geändert hat, um den CO2-Ausstoß zu reduzieren. (3)			
... weil ich den Angaben von Unternehmen zur CO2-Ausstoß-Reduktion <u>nicht vertraue</u>. (16)			
... weil es für mich schwer zu glauben ist, dass es eine Molkerei gibt, die <u>von den Tieren auf der Weide bis zum Produkt im Supermarkt</u> Kontrolle über die Produkte hat. (14)			
... weil mir <u>ein Siegel</u>, das zum Beispiel auf "klimafreundliche Produktion" hinweist oder offizielle Angaben zum „CO2-Ausstoß per 1 kg Ware" enthält, auf Milchprodukten <u>fehlt</u>. (4)			
... weil mir die <u>notwendigen Informationen</u> fehlen, um die Bedeutung des CO2-Ausstoßes in der Milchindustrie zu verstehen. (5)			
... weil <u>es schwierig ist</u>, Milchprodukte zu finden, die unter der Berücksichtigung von CO2-Ausstoß Reduktion hergestellt wurden. (6)			
... weil die Berücksichtigung des CO2-Ausstoßes beim Kauf von Milchprodukten für mich <u>einen zu großen Aufwand bedeuten würde</u>. (7)			
... weil ich <u>nicht viel Zeit</u> für den Einkauf von Milchprodukten nutze. (8)			
... weil ich Milchprodukte generell <u>nicht</u> als besonders umweltfreundlich ansehe. (9)			
... weil es für mich das Wichtigste ist, dass <u>Milchprodukte gesund sind</u>. (10)			
... weil für mich beim Einkauf von Milchprodukten <u>vor allem der Preis wichtig ist</u>. (13)			
... weil <u>pflanzliche Milchalternativen besser</u> für die CO2-Bilanz sind. (11)			
... weil ich Milchprodukte <u>immer nach denselben Entscheidungskriterien kaufe</u>, unabhängig von der Verpflichtung des Unternehmens für die Umwelt. (12)			
... weil für mich die <u>Tierhaltung wichtiger</u> ist als der CO2-Ausstoß der Molkereien. (19)			

... weil für mich <u>ökologische Produktion wichtiger</u> ist als die Berücksichtigung des CO2-Ausstoßes. (20)	
... weil ich beim CO2-Ausstoß <u>immer erst selbst recherchieren muss</u>, bevor ich dem Unternehmen vertraue. (22)	

Page Break ———————————————————————————————

End of Block: Reasons for and against

Start of Block: Attitude, social norm, behavioural control

Q11 **Wie würden Sie Ihre Haltung gegenüber Unternehmen, die Milchprodukte unter Berücksichtigung des CO2-Ausstoßes herstellen, beschreiben? <u>Für mich ist der Kauf von Milchprodukten von einem Unternehmen, das die CO2-Ausstoß-Reduktion bei der Produktion berücksichtigt, ...</u>**

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	
förderlich						schädigend
vernünftig						unvernünftig
ansprechend						belanglos
zielführend						vergebens
vorteilhaft						nachteilig

Q12 **Der Kauf von Milchprodukten von einem Unternehmen, das sich zur Reduktion des CO2-Ausstoßes verpflichtet hat, bewirkt, dass <u>ich mich wie folgt fühle</u> …..**

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	
gut						schlecht
zufrieden						unzufrieden

Page Break ————————————————————————————————

Q13
Inwieweit stimmen Sie den folgenden Aussagen zu bzw. widersprechen diesen?

Bitte berücksichtigen Sie bei Ihrer Antwort die Personen, auf deren Meinung Sie

besonders viel Wert legen. Bitte lesen Sie die Aussagen genau und nutzten die Antwortmöglichkeit aus den fünf vorgeschlagenen Möglichkeiten, die für Sie am besten passt.

Die meisten Menschen, auf deren Meinung ich besonders viel Wert lege, ...

	stimme voll zu (1)	stimme eher zu (2)	weder noch (3)	stimme eher nicht zu (4)	stimme nicht zu (5)
... <u>sind der Meinung</u>, dass ich Milchprodukte von Unternehmen kaufen sollte, die angeben, den CO_2-Ausstoß zu reduzieren. (1)					
... <u>würden mir empfehlen</u> Milchprodukte von Unternehmen zu kaufen, die angeben, den CO_2-Ausstoß zu reduzieren. (2)					
... <u>finden es wichtig</u>, dass ich Milchprodukte von Unternehmen kaufe, die angeben, den CO_2-Ausstoß zu reduzieren. (3)					
... <u>würden selbst</u> Milchprodukte von Unternehmen kaufen, die angeben, den CO_2-Ausstoß zu reduzieren (4)					
Ich fühle mich <u>durch mein soziales Umfeld verpflichtet</u>, Milchprodukte von Unternehmen zu kaufen, die angeben, den CO_2-Ausstoß zu reduzieren. (5)					

Page Break

Q14 **Die folgenden Aussagen beziehen sich auf Ihren persönlichen Einfluss auf die Entscheidung für nachhaltige Milchprodukte.** Inwieweit stimmen Sie den folgenden Aussagen zu bzw. widersprechen diesen?

Milchprodukte von Unternehmen zu kaufen, die sich zur CO_2-Ausstoß-Reduktion verpflichtet haben, …

	stimme voll zu (1)	stimme eher zu (2)	weder noch (3)	stimme eher nicht zu (4)	stimme nicht zu (5)
... wäre für mich einfach, wenn ich wollte. (1)					
... wäre mir möglich, wenn ich wollte. (2)					
... ist meine eigene Entscheidung. (3)					
... ist für mich generell nicht möglich. (4)					

Page Break

End of Block: Attitude, social norm, behavioural control

Q15
Wie würden Sie Ihre persönliche Haltung beschreiben, wenn Milchprodukte angeboten werden, bei denen die Unternehmen auf CO2-Ausstoß-Reduktion achten? Dabei ist es unerheblich, ob Sie derzeit Unternehmen kennen, die angeben, den CO2-Ausstoß zu reduzieren.

Bei meinem Kauf von Milchprodukten auf die Verpflichtung des Unternehmens zur CO2-Ausstoß-Reduktion zu achten, ...

	stimme voll zu (1)	stimme eher zu (2)	weder noch (3)	stimme eher nicht zu (4)	stimme nicht zu (5)
... empfinde ich als moralisch verpflichtend. (1)					
... sollte man meiner Meinung nach immer tun. (2)					
... halte ich im Allgemeinen für sehr wichtig. (3)					
... empfinde ich aufgrund meiner eigenen Werte und Prinzipien als verpflichtend, egal was andere Menschen tun. (4)					

Page Break

Q16 **Bitte geben Sie an, inwieweit Sie den folgenden Aussagen zu den Auswirkungen des CO2- Ausstoßes zustimmen. Bitte lesen Sie die Aussagen ganz genau durch und kreuzen die Antwortmöglichkeit aus den fünf**

Möglichkeiten an, die Ihrer Meinung nach am besten zu jeder einzelnen Aussage passt.

	stimme voll zu (1)	stimme eher zu (2)	weder noch (3)	stimme eher nicht zu (4)	stimme nicht zu (5)
Der CO2-Ausstoß der Lebensmittelindustrie hat negative Auswirkungen auf den Klimawandel (z. B. steigende Temperaturen, extreme Wetterereignisse). (2)					
Der CO2-Ausstoß der Molkereien hat einen negativen Einfluss auf den Klimawandel. (9)					
Der CO2-Ausstoß der Molkereien kann großen Einfluss auf den Klimawandel haben. (8)					
Die Molkereien sind für einen großen Anteil des CO2-Ausstoßes der Lebensmittelindustrie verantwortlich. (3)					
Der CO2-Ausstoß der Milchindustrie hat negative Auswirkungen auf die Lebensqualität späterer Generationen. (4)					
Es besteht dringender Handlungsbedarf bezüglich des CO2-Ausstoßes der Milchindustrie. (6)					
Eine umweltbewusste Molkerei reduziert den CO2-Ausstoß, um den Klimawandel zu minimieren. (7)					
Die Milchkühe sind für den Hauptanteil des Ausstoßes der klimaschädlichen Gase der Milchindustrie verantwortlich. (11)					
Molkereien sind durch ihren CO2-Ausstoß für negative Umweltauswirkungen verantwortlich - lokal und regional. (13)					
Bitte kreuzen Sie "stimme nicht zu" an. (15)					

Page Break

Q17

Bitte geben Sie an, inwieweit Sie den folgenden Aussagen zur Verantwortung zur CO2-Ausstoß-Reduktion zustimmen. Bitte lesen Sie die Aussagen ganz genau durch und kreuzen die Antwortmöglichkeit aus den fünf Möglichkeiten an, die Ihrer Meinung nach am besten zu jeder einzelnen Aussage passt.

	stimme voll zu (1)	stimme eher zu (2)	weder noch (3)	stimme eher nicht zu (4)	stimme nicht zu (5)
Ich glaube, dass <u>jeder Konsument</u> von Milchprodukten für den durch die Milchindustrie verursachten CO2-Ausstoß <u>mitverantwortlich ist</u>. (5)					
Ich bin der Meinung, dass <u>alle Konsumenten</u> von Milchprodukten <u>gemeinsam</u> für den durch die Milchindustrie verursachten CO2-Ausstoß verantwortlich sind. (6)					
<u>Jeder einzelne Konsument</u> von Milchprodukten muss die Verantwortung für den durch die Milchindustrie verursachten CO2-Ausstoß <u>mit übernehmen</u>. (7)					
Beim Kauf von Milchprodukten ist <u>für mich</u> der CO2-Ausstoß des Unternehmens, das die Produkte herstellt, sehr wichtig. (8)					
Für mich ist es <u>nicht wichtig</u>, wie die Erzeuger von Milchprodukten mit dem CO2-Ausstoß und den damit verbundenen Klimaauswirkungen umgehen. (9)					

Page Break

End of Block: Norm Activation Model

Q18 **Inwieweit stimmen Sie den folgenden Aussagen zur Absicht zu, Milchprodukte von Unternehmen zu kaufen, die sich zur CO2-Ausstoß-Reduktion verpflichtet haben?** *Dabei ist es unerheblich, ob Sie derzeit Unternehmen kennen, die angeben, den CO2-Ausstoß zu reduzieren.*

Milchprodukte von Unternehmen zu kaufen, die sich verpflichten, den CO2-Ausstoß zu reduzieren, ...

	stimme voll zu (1)	stimme eher zu (2)	weder noch (3)	stimme eher nicht zu (4)	stimme nicht zu (5)
... könnte ich mir vorstellen. (5)					
... beabsichtige ich zukünftig. (6)					
... dafür werde ich meinen Aufwand erhöhen. (7)					

Page Break

End of Block: Intention

Q19 **Welche Unternehmen aus der Lebensmittel Branche sind Ihnen im Zusammenhang mit CO2-Ausstoß-Reduktion bekannt? Bitte nennen Sie die Unternehmen oder Marken, die Ihnen einfallen.**

_____

Page Break

Q20 **Wie oft nutzen Sie die folgenden Verkehrsmittel?**

	oft (1)	gelegentlich (2)	nie (3)
Nutzung des Fahrrades oder zu Fuß gehen, wann immer dies möglich ist (1)			
Nutzung von öffentlichen Verkehrsmitteln (2)			
Nutzung von Car Sharing/Car-Pooling (3)			

Page Break

Q21 Noch ein paar generelle Fragen zu Ihrem Einkaufs- und Konsumverhalten. Welche der genannten Verhaltensweisen treffen auf Sie zu?

	immer (1)	normaler-weise (2)	ab und zu (3)	selten (4)	nie (5)
Energie sparen (z.B. Ausschalten des Lichtes, wenn ich den Raum verlasse) (1)					
Einkauf von energiefreundlichen und / oder energieeffizienten Produkten (energieeffiziente Haushaltsgeräte, energieeffiziente Glühbirnen,…) (2)					
Umweltbewusster Wasserverbrauch (kurz duschen, Waschmaschine / Geschirrspüler vor dem Start vollständig füllen) (3)					
Recycling von Papier (4)					
Recycling von Batterien und elektrische Geräten (5)					
Recycling von leere Flaschen (6)					
Recycling von Kunststoff und Metall (15)					
Mülltrennung (14)					
Ich kaufe lokale/regionale Lebensmittel (7)					
Ich kaufe Bio-Lebensmittel (8)					
Berücksichtigung der Verpackung eines Produkts (ich bevorzuge recyceltes Material, unverpacktes Obst und Gemüse,…) (9)					
Nutzung von eigenen/mitgebrachten Taschen beim Einkauf (10)					
Ich unterhalte mich mit Freunden über die Umweltsituation und die damit verbundenen Probleme (11)					
Ich weise andere darauf hin, wenn ich unökologisches Verhalten beobachte (12)					
Ich kaufe keine Produkte von Unternehmen, die für eine nicht-ökologische Arbeitspraxis bekannt sind (13)					

Page Break

Q22 **Wie würden Sie den Konsum Ihres Haushaltes von Milchprodukten einschätzen?**

	täglich (4)	mehrmals pro Woche (5)	einmal pro Woche oder weniger (6)
Joghurt/Quark/Skyr/Kefir (inkl. Trinkjoghurt) (1)			
Käse (2)			
Milch (3)			

Q23 **Wie oft kaufen Sie Milchprodukte?**

	mehrmals pro Woche (1)	einmal die Woche (2)	einige Male im Monat (3)
Joghurt/Quark/Skyr/Kefir (inkl. Trinkjoghurt) (1)			
Käse (2)			
Milch (3)			

Page Break

Q24 **Welche Art von Milchprodukten kaufen Sie für Ihren Haushalt? Nur eine Antwort möglich.**
Nur tierische Milchprodukte (1)
Hauptsächlich tierische Milchprodukte, aber auch pflanzliche Milchalternativen (2)
Hauptsächlich pflanzliche Milchalternativen, aber auch tierische Milchprodukte (4)
Nur pflanzliche Milchalternativen (3)

Skip To: End of Block If Welche Art von Milchprodukten kaufen Sie für Ihren Haushalt? Nur eine Antwort möglich. = <u>Nur pflanzliche</u> Milchalternativen

Q25 **Lebt in Ihrem Haushalt <u>mindestens</u> eine Person, die sich <u>vegan</u> ernährt?**
Ja (1)
Nein (2)

End of Block: Purchase Behaviour

Start of Block: Demographics

X→

Q26 Welchen beruflichen Status haben Sie zur Zeit? Nur eine Antwort möglich.
Schüler (1)
Auszubildender (2)
Student (3)
Freiwilliges soziales Jahr / Bundesfreiwilligendienst (4)
Angestellter / Beamter (5)
Geschäftsführer / Vorstand (angestellt) (6)
Selbständig / Unternehmer (7)
Hausfrau / Hausmann, im (Vor-)Ruhestand (8)
Zurzeit arbeitssuchend (9)
Sonstiges,   und   zwar: (10)
_____
Möchte ich nicht angeben (99)

Page Break

X→

Q27 Welche von den folgenden Wohnformen trifft auf Sie zu?
Verheiratet oder mit Partner zusammenlebend, ohne Kinder (1)
Verheiratet oder mit Partner zusammenlebend, mit Kindern (4)
Wohngemeinschaft (5)
Lebe bei meinen Eltern (6)
Mehrgenerationen-Haushalt mit Großeltern, Eltern, Kindern oder anderen Verwandten im Haus (7)
Ohne Partner mit Kindern im Haushalt (8)
Allein lebend, Single-Haushalt (9)
Möchte ich nicht angeben   (99)

Skip To: Q29 If Welche von den folgenden Wohnformen trifft auf Sie zu? = Allein lebend, Single-Haushalt
Skip To: Q29 If Welche von den folgenden Wohnformen trifft auf Sie zu? = Möchte ich nicht angeben

Page Break

X→

Q28 Wie viele Personen leben in Ihrem Haushalt, <u>außer</u> Ihnen selbst? Bitte kreuzen Sie die passenden Kategorien an <u>und</u> vermerken die Anzahl der entsprechenden Personen für die jeweilige Kategorie.
Erwachsene/r (ab 18 Jahre) (1)
Jugendliche (13 bis 17 Jahre) (2)
Kind/er (4 bis 12 Jahre) (3)
Kleinkind/er (2 bis 3 Jahre) (4)
Baby/s (bis 1 Jahr) (5)
Möchte ich nicht angeben (99)

Page Break

X→

Q29 Können Sie bitte Ihre Postleitzahl oder die Stadt in der Sie wohnen angeben.
PLZ (1) _____
Stadt (2) _____
Möchte ich nicht angeben (99)

Page Break

X→

Q30 Wohnen Sie in einer....
…Millionenstadt? (1)
...Großstadt (über 100.000 bis unter 1 Mio. Einwohner)? (2)
…mittelgroßen Stadt (über 20.000 bis 100.000 Einwohner)? (3)
…Kleinstadt (über 5.000 bis 20.000 Einwohner)? (4)
…kleineren Stadt / einem kleinerem Ort (bis 5.000 Einwwohner)? (5)
Möchte ich nicht angeben (99)

Page Break

X→

Q31 Wie hoch ist das monatliche Nettoeinkommen Ihres Haushaltes?
unter 1000 Euro (1)
1.000 bis unter 1.500 Euro (4)
1.500 bis unter 2.000 Euro (5)
2000 bis unter 3.000 Euro (6)
3.000 bis unter 5.000 Euro (7)
5.000 bis unter 7.000 Euro (8)
7.000 bis unter 10.000 Euro (9)
10.000 Euro und mehr (10)
Möchte ich nicht angeben (99)

End of Block: Demographics

A.17 Questionnaire – English Version

Screening:

Q1 Screening 1: **Is at least one in your household consuming dairy products like milk, yoghurt, cheese?** (yes/no)

Q2 Screening 2: **Are you in your household responsible/partly responsible for the grocery shopping?** (yes/no)

Quotas

Q3 **Some questions to your person.** Are you female, male, divers?

Q4 **Can you please name your age?**
-   I am ……. years old
-   I do not like to name my age

Q5 **What is the highest degree or level of school/education you have completed?**
-   No school degree
-   Less than high school degree
-   High school degree or equivalent
-   Completed professional education / apprenticeship
-   Completed secondary/professional education (Meister/Fachwirt)
-   Bachelor's degree
-   Master's degree / Diploma / Magister
-   Doctorate, Habilitation
-   Would prefer not to name it

Main Questionnaire

Q6
Dear study participant,
companies are increasingly working with sustainability strategies, including the food industry. This study is a scientific study in collaboration between Kingston University in London and the industry. The aim of the study is to get to know you better as a consumer of dairy products. We really appreciate your participation in this interesting topic that affects us all. There are no right or wrong answers to the questions asked. Please answer **spontaneously** according to your personal opinion and feelings when reading the questions and statements. We can only develop targeted recommendations for the industry if we receive **your own and honest opinion to the questions asked**. Please tick the box that best reflects your opinion on each of the statements. **Please read the statements carefully. When answering the questions, please assume your typical shopping behaviour when buying groceries, especially when buying common dairy products such as yoghurt, cheese and milk.**

Q7

Are there any foods where you pay particular attention to CO2 emissions when shopping? Please consider all food products, not only dairy products. Please name these foods (multiple answers possible).

Q8

Has the consideration of CO2 emissions when buying your daily groceries changed due to the current COVID 19 pandemic?
- Yes, I consider CO2 emissions more
- Yes, I am considering CO2 emission less
- No, has stayed the same

Q9

If there were companies that consider CO2 emissions reduction in the production process of dairy products, what are the reasons <u>for buying</u> these dairy products? Please read the statements carefully. Please only select "*applies completely*", "*rather applies*" if it is <u>a real reason</u> for you. Please differentiate between "*applies completely*" and "*rather applies*". If it is no reason for you, please select "does not apply". (answer possibilities: applies completely, rather applies, does not apply)

I buy dairy products from companies that reduce CO2 emissions because ...

- …<u>my personal purchase</u> has an effect on the climate protection.
- … because <u>each</u> purchase of groceries supports to reduce the CO2 emission. have an environmental impact
- …the reduction of the CO2 emission of the dairy industry is <u>as well</u> good for the next generation
- … the CO2 emission reduction of the dairy industry improves <u>my personal living space.</u>
- … I <u>generally buy organic and local products</u> and assume that these are produced under consideration of the CO2 emission.
- … <u>I trust the brands I buy</u> to reduce the carbon footprint in production
- ...the goods are labeled with an <u>environment seal</u> that indicates CO2 emissions reduction
- ... I buy <u>well-known brands</u>, because I believe that they more likely have the opportunity and the obligation to invest in reducing CO2 emissions.
- ... I <u>generally take time</u> to choose sustainably produced food products
- … I purchase <u>expensive dairy products</u>, then I am sure that the CO2 emission will be considered.
- .. if all consumers decide for dairy products produced under consideration of CO2 emission reduction, <u>more and more companies</u> will reduce the CO2 emission in the production process and therewith do something good for the environment.
- Please select ""completely applies".

Q10

If there were companies that pay attention to the reduction of CO2 emissions in the production process of dairy products, what reasons <u>would hold you back buying these dairy products</u>? Please read the statements carefully and choose "applies completely", "rather applies" if there is <u>a real reason for you to consider CO2 emissions information</u>. Please differentiate between "applies completely" and "rather applies". If it is no reason for you, please select "does not apply". (answer possibilities: applies completely, rather applies, does not apply)

I do not consider information regarding CO2 emission reduction of dairy companies not, …
- ... my personal purchase of dairy products has <u>no effect</u> on the reduction in CO2 emissions.
- … <u>I do not know dairy companies</u> that claim to reduce the CO2 emissions.
- … <u>I don't believe</u> there is a dairy company that has changed the production method to reduce CO2 emissions.
- … <u>I do not trust</u> the information given by companies on reducing CO2 emissions.
- ... it is hard for me to believe that there is a dairy company that has control over the products <u>from the animals on the farm to the products in the supermarket</u>.
- … I miss <u>a seal</u> on dairy products that, for example, indicates "climate-friendly production" or contains official information on "CO2 emissions per 1 kg of goods".
- … because I don't have the <u>necessary information</u> to understand the importance of CO2 emissions in the dairy industry
- … because <u>it is difficult</u> to find dairy products that have been manufactured considering the CO2 emission reduction.
- … taking into account the CO2 emissions when buying dairy products would mean <u>too much effort for me</u>.
- …<u>I don't spend a lot of time</u> shopping for dairy products.
- …because I generally <u>do not consider</u> dairy products as particularly environmentally friendly.
- … the most important purchase criterium for me is that dairy products are <u>healthy</u>.
- … when buying dairy products <u>price is of highest importance</u>.
- … <u>plant-based dairy alternatives</u> are better for the CO2 balance.
- … I always buy dairy products based on <u>the same decision criteria</u>, regardless of the company's commitment to the environment.
- ... for me <u>animal welfare is more important</u> than the CO2 emissions of the dairy companies.
- … for me, <u>ecological production is more important</u> than taking CO2 emissions reduction into account.
- … because I always have to do <u>my own research</u> into CO2 emissions before I trust the communication of the company.

Q11
How would you describe your attitude towards companies producing dairy production under the consideration of CO2 emission reduction? <u>For me</u>, buying dairy products from a company that is committed to CO2 emission reduction when producing dairy products is ... (1 – 5)

beneficial - harmful
wise – foolish
attractive - unattractive
valuable - worthless
advantageous – disadvantageous

Q12
Buying dairy products from a company that is committed to reducing CO2 emissions makes <u>me feel …</u> (1-5)

good – bad
satisfied – dissatisfied

Q13
To what extent do you agree or disagree with the following statements? In your answer, please take into account the people whose opinion you value. Please read the statements carefully and use the answer option from the five suggested options that best suits you. Evaluate on a scale from (1) strongly agree, (2) somewhat agree, (3) neither agree or disagree, (4) somewhat disagree, (5) completely disagree.

Most of the people whose opinion I value very much ...

- ... <u>believe</u> that I should buy dairy products from companies that claim to reduce CO2 emission.
- ... <u>would recommend</u> buying dairy products from companies that claim to reduce CO2 emission.
- ... <u>think it's important</u> that I buy dairy products from companies that claim to reduce CO2 emission.
- ... would <u>themselves buy</u> dairy products from companies that claim to reduce CO2 emission.
- Because of <u>my social environment</u>, I feel obliged to buy dairy products from companies that claim to reduce CO2 emission.

Q14
The following statements relate to your personal influence on the decision for sustainable dairy products. To what extent do you agree or disagree with the following statements? Evaluate on a scale from (1) strongly agree, (2) somewhat agree, (3) neither agree or disagree, (4) somewhat disagree, (5) completely disagree.
Buying dairy products from companies that have committed to reducing CO2 emission ...

- … <u>would be easy for me</u> if I wanted to.
- … <u>would be possible for me</u> if I wanted to.
- … <u>it's my own decision</u>.
- ... is generally <u>not possible</u> for me.

Q15
Please evaluate the following statements concerning your personal attitude towards the purchase of dairy products produced under the commitment of CO2 emission reduction. It does not matter whether you currently know dairy companies that claim to reduce CO2 emission. Evaluate on a scale from (1) strongly agree, (2) somewhat agree, (3) neither agree or disagree, (4) somewhat disagree, (5) completely disagree.
The commitment of dairy companies to reduce the CO2 emission reduction ...

- … consider I as morally obligatory.
- … should be always be done after my opinion.
- … I consider generally as very important.
- … consider I based on my own values and principles as obligatory, no matter what other people do.

Q16
Please indicate to what extent you agree with the following statements on the effects of CO2 emissions. Please read the statements very carefully and tick the answer option from the five options that in your opinion best fits each individual statement. Evaluate on a scale from (1) strongly agree, (2) somewhat agree, (3) neither agree or disagree, (4) somewhat disagree, (5) completely disagree.

- The CO2 emissions of the food industry have negative effects on climate change (e.g. rising temperatures, extreme weather events).
- The CO2 emissions of dairy companies have a negative impact on climate change.
- The CO2 emissions of dairy companies can have a major impact on climate change.
- Dairy companies are responsible for a large proportion of the CO2 emissions of the food industry.
- The CO2 emissions of the dairy industry have a negative impact on the quality of life for future generations.
- There is an urgent need for action with regard to the CO2 emissions of the dairy industry.
- An environmentally conscious dairy company reduces the CO2 emission in order to minimize climate change.
- Cows are responsible for the majority of the emission of climate-damaging gases from the dairy industry.
- Dairy companies are responsible for negative environmental impacts due to their CO2 emission - locally and regionally.
- Please choose "completely disagree".

Q17
Please indicate to what extent you agree with the following statements on responsibility for reducing CO2 emissions. Please read the statements very

carefully and tick the answer option from the five options that in your opinion best fits each individual statement. Evaluate on a scale from (1) strongly agree, (2) somewhat agree, (3) neither agree or disagree, (4) somewhat disagree, (5) completely disagree.

- I believe that every consumer of dairy products is partly responsible for the CO2 emissions caused by the dairy industry.
- I believe that all dairy consumers are jointly responsible for the CO2 emissions caused by the dairy industry.
- Every single consumer of dairy products must take responsibility for the CO2 emissions caused by the dairy industry.
- The CO2 emission of the dairy company is very important to me when buying dairy products.
- For me, it is not important how dairy companies are dealing with CO2 emission and the associated impact on the climate.

Q18

To which extent do you agree/disagree to the following statements to buy dairy products produced under the consideration of CO2 emission reduction? Please evaluate the statements on a scale from 1-5 considering the following meaning: (1) strongly agree, (2) somewhat agree, (3) neither agree or disagree, (4) somewhat disagree, (5) completely disagree. It does not matter whether you currently know companies that claim to reduce CO2 emissions.

- I am planning to buy dairy products from a company committed to CO2 emission reduction.
- I intent to buy dairy products form companies committed to CO2 emission reduction.
- I will extent the effort on choosing dairy products from companies committed to CO2 emission reduction.

Q19

Which companies in the food industry are you familiar with in connection with reducing CO2 emissions? Please name the companies or brands you can think of.

Q20

How often do you use the following modes of transportation. Please choose "often", "once in a while" or "never".
- Use a bicycle or walk whenever possible
- Use public transportation
- Use car-sharing/car pooling

Q21

A few more general questions about your shopping and consumption behaviour. Which of the above behaviours apply to you? Please choose "always", "normally", "once in a while", "seldom", "never".

- Save energy (turning off the lights when leaving the room"
- Purchase of energy-friendly and / or energy-efficient products (energy-efficient household appliances, energy-efficient light bulbs, ...)
- Environmentally conscious water consumption (take a short shower, fill the washing machine / dishwasher completely before starting)
- Paper recycling
- Recycling of batteries and electronic devices
- Recycling of bottles and cans
- Recycling of plastic and metal
- Waste separation
- I buy local/regional food
- I buy organic food
- Consideration of the packaging of a product (I prefer recycled material, unpacked fruit and vegetables, ...)
- Use of your own / brought bags when shopping
- I talk to friends about the environmental situation and the problems associated with it
- I point this out to others when I observe unecological behaviour
- I do not buy products from companies that are known to have non-ecological working practices

Q22
How would you rate your household's consumption of dairy products?
"daily", "several times a week", "once a week or less"
- Yoghurt / Quark / Skyr / Drinking Yoghurt
- Cheese
- Milk

Q23
How often do you buy dairy products?
- Yoghurt / Quark / Skyr / Drinking Yoghurt
- Cheese
- Milk

Q24
Which kind of dairy products are you purchasing for your household? Only one answer is possible.
- Only animal based dairy products
- Mainly animal-based dairy products, but as well plant-based products
- Mainly plant-based dairy alternatives, but as well animal-based dairy products
- Only plant-based dairy alternatives

Q25
Does at least one person live in your household who follow a vegan diet? Yes, No

Q26
What is your current professional status? Only one answer possible.
- Pupil
- Apprentice/Trainee
- Student
- Voluntary social year / federal volunteer
- Employed, Civil servant
- Managing director, Board member
- Self employed
- House wife/house man, pre-retirement
- Looking for work
- Other, namely
- Would not like to name it

Q27
Which of the following types of housing applies to you?
- Married or living with a partner, without children
- Married or living with a partner, with children
- Commune/shared apartment
- Living at my parents place
- Multi-generation household with grandparents, parents, children or other relatives in the house
- Single with children
- Single, living alone
- Would not like to name it

Q28
How many people live in your household besides yourself? Please tick the appropriate categories and note the number of corresponding people for the respective category.
- Adults (18+)
- Teenager (13 – 17 years old)
- Kids (4-12 years-old)
- Toddlers (2-3 years old)
- Babies (up to 1 year)
- Would not like to name it

Q29
Can you please name your postcode or the city you are living in.
- postcode
- City
- Would not like to name it

Q30
Are you living in a …

- Metropolis (more than 1 million)
- Big city (more than 100.000 inhabitants up to 1 million)
- Medium size city (20.000 to 100.000 inhabitants)
- Small city (5.000 to 20.000 inhabitants)
- Village (up to 5.000 inhabitants)
- Would not like to name it

Q31
What is the monthly net income of your household?
- less than 1.000 Euro
- 1.000 up to less than 1.500 Euro
- 1.500 up to under 2.000 Euro
- 2.000 up to under 3.000 Euro
- 3.000 up to under 5.000 Euro
- 5.000 up to under 7.000 Euro
- 7.000 up to under 10.000 Euro
- 10.000 Euro and more
- Would not like to name it.

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