



Department of Business and Management

Master Thesis in Marketing

Jens Henrik Korgerud

Consumers' WTB and WTP for Sustainable Products: The Moderating Effect of General and Specific Attitudes

Double degree candidate

Jens Henrik Korgerud (ID No. 742761)

Department of Business and Management

Supervisor

Prof. Simona Romani, PhD

Department of Business and Management

Co-supervisor

Prof. Giacomo Sillari, PhD

Department of Political Science

ACADEMIC YEAR

2021/2022

Acknowledgments

First and foremost, I wish to show my sincere gratitude and appreciation to my supervisor, Professoressa Simona Romani, and her teaching assistant, Dr. Antea Gambicorti, for their impeccable guidance, patience, and support throughout my research project. Additionally, I would also like to send a big thanks to the incredible professors at BI Norwegian Business School and the LUISS Guido Carli University, for the valuable learning outcomes I have gained in the BI-LUISS Joint Masters of Science in Marketing program and during my bachelor's at BI. A special mention goes to Assistant Professor Eirik Haus at BI Norwegian Business School for being a valuable sparring partner and for making me interested in the quantitative side of marketing.

I am forever thankful to the Norwegian Armed Forces, for teaching me important lessons in life which I have benefited from throughout my education. With discipline and dedication, we can achieve anything.

Last but not least, I am also grateful to my family and friends for always supporting me. I would be remiss in not mentioning my classmates in Oslo and Rome during the past two years for making this journey incredible—I have gained friendships for life.

To my grandfather, and my great aunt.

Enjoy the reading!

“If you make your bed every morning, you will have accomplished the first task of the day. It will give you a small sense of pride and it will encourage you to do another task, and another, and another. By the end of the day, that one task completed will have turned into many tasks completed. Making your bed will also reinforce the fact that the little things in life matter. If you can't do the little things right, you will never be able to do the big things right. And, if by chance you have a miserable day, you will come home to a bed that is made—that you made—and a made bed gives you encouragement that tomorrow will be better.

If you want to change the world, start off by making your bed.”

- Admiral William H. McRaven, [2014](#)

Jens Henrik Korgerud



Table of Contents

0. Summary	1
1. Introduction	2
2. Literature review	5
2.1 Complex human behavior: the inconsistent consumer	5
2.2 Sustainable consumer behavior	6
2.3 Categorization of sustainable consumer behavior	8
2.4 Attitudes and the attitude-behavior gap	8
2.5 Willingness-to-Pay (WTP)	10
3. Research question	13
4. Conceptual framework and hypotheses.....	14
5. Methodology.....	16
5.1 Research approach.....	16
5.2 Sampling strategy	16
5.3 Operationalization	17
5.3.1 <i>Product type</i>	17
5.3.2 <i>Willingness-to-Pay</i>	19
5.3.3 <i>General attitude</i>	19
5.3.4 <i>Specific attitude</i>	20
5.3.5 <i>Willingness-to-Buy</i>	22
5.3.6 <i>Manipulations</i>	23
5.4 Questionnaire.....	24
5.5 Pilot study	25
5.5.1 <i>Manipulation checks</i>	26
5.5.2 <i>Principal Component Analyses (PCA)</i>	26
5.5.3 <i>Discussion</i>	28
5.5.4 <i>Minimum sample size</i>	29
5.6 Main study	29
5.6.1 <i>Data rinsing</i>	29
5.6.2 <i>Descriptive statistics</i>	29
5.6.3 <i>Validity and reliability</i>	30
5.6.4 <i>Group statistics</i>	35
6. Findings	36
6.1 Overview	36
6.2 Hypothesis testing.....	37
6.2.1 <i>Willingness-to-Pay as outcome</i>	37
6.2.2 <i>Willingness-to-Buy as outcome</i>	41

7. Discussion	47
8. Limitations and future research.....	49
8.1 Inconsistency in the <i>specific attitude</i> measurement scales	49
8.2 Differences across product categories	49
8.3 Generation Z's WTB and WTP for sustainable products	50
8.4 Geographical and cultural differences	50
8.5 Investigating the mechanisms with real purchasing data.....	50
8.6 Investigating WTP using a reference price.....	51
8.7 Investigating WTB and WTP through various levels of sustainability	51
9. Contributions and managerial relevance	52
10. Conclusion.....	53
11. Bibliography.....	54
12. Appendices	61
Appendix 1: Pilot study survey flow and questionnaire	61
Appendix 2: Main study survey flow and questionnaire	80
13. Extended summary.....	95
13.1 Introduction and literature review	95
13.1.1 <i>Complex human behavior: the inconsistent consumer</i>	95
13.1.2 <i>Sustainable consumer behavior</i>	95
13.1.3 <i>Categorization of sustainable consumer behavior</i>	96
13.1.4 <i>Attitude and the attitude-behavior gap</i>	97
13.1.5 <i>Willingness-to-Pay</i>	98
13.2 Research question	98
13.3 Conceptual framework and hypotheses	99
13.4 Methodology.....	100
13.4.1 <i>Overview</i>	100
13.4.2 <i>Pilot study</i>	101
13.4.3 <i>Main study</i>	102
13.5 Findings and discussion.....	103
13.6 Limitations and suggestions for further research.....	103
13.7 Contributions and managerial relevance	106
13.8 Conclusion	107

0. Summary

The following thesis investigates how the consumers' *general* and *specific* attitudes toward sustainability affect their Willingness-to-Buy (WTB) and Willingness-to-Pay for sustainable products. Consumer behavior is complex, hard to predict, and inconsistent since we as humans are irrational—influenced by numerous factors that are often 'hidden' behind a complex myriad of social and physiological mechanisms. Research and survey data have revealed that consumers increasingly report favorable attitudes, preferences, and intentions toward purchasing sustainable products; however, the consumers do not follow through. This issue is commonly referred to as the 'attitude-intention' and 'intention-action' gap, which has received major attention among researchers worldwide, as consumption plays a significant role in the overall CO₂ emissions in addition to contributing to issues related to social sustainability.

Consumers' attitudes have been frequently investigated as a mechanism to predict sustainable behavior, although the results have been inconsistent. Ajzen & Fishbein (1977) and Frymier & Nadler (2017) criticize how researchers measure attitudes as it is commonly performed on a general level, which fails to capture the consumers' *true* attitude towards an attitudinal object because they are fragmented across a behavioral domain. To succeed with predictions, it is necessary to have a corresponding consistency in the level of specificity between the attitude that is measured and the attitudinal object. Ultimately, the thesis investigates the following research question:

“How do consumers' general and specific attitudes towards sustainability affect their Willingness-to-Pay and Willingness-to-Buy sustainable products? And, are specific attitudes better at predicting the outcomes?”

To answer the research question, a 2 (sustainable vs traditional laundry detergent) × 2 (positive vs negative attitude towards sustainability) between-subjects factorial experiment was carried through, measuring attitudes on a general and specific level with respect to the attitudinal object; using a sustainable laundry detergent. The thesis finds that general attitudes fail to moderate the consumers' WTB and WTP for sustainable products and that specific attitudes positively moderate both their WTB and WTP, in support of the overall thesis. Moreover, consumers, in general, are found to have an 11.93% WTP price premium in favor of the sustainable product, which increases to 14.17% when moderated by positive, *specific* attitudes. Moreover, consumers, in general, are 4.93% less likely to purchase the sustainable (vs traditional) product, however, it is positively moderated by positive *specific* attitudes, thus, increasing the WTB to -3.40%. The mean WTB was still negative yet marginal, therefore not likely to have a major impact on the overall profitability when considering the consequent WTP premium of consumers with positive attitudes towards sustainability.

The overall findings provide managers with valuable insights in terms of segmentation parameters, in addition to specific green price premiums. Sustainable products, when directly marketed towards segments with positive attitudes towards sustainability, yield a market opportunity and increased profitability, as firms are reluctant to provide sustainable products as they are usually more expensive to produce and lack an understanding of the price elasticities for sustainable products. A limitation of the thesis, however, is that the findings are not likely to be generalizable across multiple product categories. For an extended summary, please see [chapter 13](#).

1. Introduction

Marketing can improve lives, strengthen societies, and benefit the world at large; however, it can consequently hurt consumers, communities, employees, and the environment (Moorman, [2018](#)). In 2018, the Journal of Marketing encouraged researchers within the field to not only focus on how marketing can increase a firm's financial performance but also on how it can simultaneously contribute to "win-win" solutions by improving social welfare (Moorman, [2018](#)). Ultimately, a call for better marketing for a better world has been served, which the current thesis aims to pursue. Global initiatives are focused on promoting sustainable development, such as the UN Sustainable Development Goals (SDGs), in addition to alarming reports about our planet's current and future state, ultimately illustrating the ever-growing importance of more research on sustainable business practices and how it affects consumers.

Consumers increasingly report positive attitudes and preferences toward sustainable products (Park & Lin, [2020](#); Deloitte, [2021](#)). Consequently, a growing number of companies realize the importance of Corporate Social Responsibility (CSR) and adopt concepts such as the 'triple bottom line' (the three P's; Profit, People, and the Planet) to measure their social and environmental impact in addition to their financial performance, as CSR initiatives in many cases have proven to drive business success (Miller, [2020](#); Kenton, Boyle, & Kvilhaug, [2022](#); Fernando, Brock, & Munichello, [2022](#)).

Realizing that consumers embrace sustainability and that it affects their attitudes and preferences towards companies and their brands means that firms can use sustainability actively to differentiate their products and brands from competitors in their positioning strategies. A popular strategy among firms to achieve such differentiation involves using ecolabels, which aim to inform consumers about the product's sustainable features to help them make informed decisions and, in turn, stimulate the demand and preferences for the product (Gallestegui, [2002](#); Donato & D'Aniello, [2021](#)). Not only does it stimulate the consumers, but it also incentivizes sustainability in the firms' offerings and business practices for them to qualify for specific ecolabels.

While increasing demand for sustainable products incentivizes producers to go 'green', an issue is that these goods tend to be pricier than conventionally produced goods (Krososky, [2021](#)). Reports suggest that sustainably produced goods are 75 to 85% more expensive than conventionally produced variants, and in the most extreme categories, such as beauty and health, the prices reach a staggering 220% (Gerhardt, [2022](#)). The main, simple reason is higher production and operating costs. Manufacturers of sustainable goods (compared to conventional) are at a financial disadvantage as they are commonly produced with less cost-efficient methods, such as providing workers with 'fair pay', fair working conditions, and using eco-friendly materials (Krososky, [2021](#)). Ultimately, the increased costs associated with sustainable products force a green price premium on consumers, which some producers might see as an opportunity to increase their profit margins by capitalizing on increasingly positive attitudes and preferences toward sustainable

products. However, without thoroughly understanding the consumers' Willingness-to-Pay (WTP) for sustainable goods and its underlying mechanisms, in addition to the consumers' Willingness-to-Buy (WTB), companies are at risk of market failure.

Research on consumers' WTP for sustainable products has to the best of my knowledge, yet to be published in high-ranking marketing journals. Arguably, research on consumers' WTP for sustainable products and the underlying influencing mechanisms are still scarce. In existing research, the focus has mainly been on consumers' WTP for green food and green energy, as well as some niche categories (e.g., Li & Kallas, [2021](#); Sundt & Rehdanz, [2015](#); Yang, Hu, Mupandawana, & Liu, [2012](#); Sammer & Wüstenhagen, [2006](#)). However, a recent meta-analysis of consumers' WTP for sustainable food found that consumers, on average, are willing to pay a price premium of 29.5% over conventional food (Li & Kallas, [2021](#)). Furthermore, even though consumers report high WTP for sustainable products across multiple categories (see Statista, [2022](#); Li & Kallas, [2021](#); van Gelder, [2021](#)), research suggests that there is an 'intention-action' gap between consumers' positive attitudes and preferences for these products, and their actual purchasing behavior (White, Hardisty, & Habib, [2019](#); Moser, [2015](#); Luchs, Naylor, Irwin, & Raghunathan, [2010](#), p. 18). In the past decade, most research on sustainable consumption has investigated how to close this gap, often using purchase intention as the outcome variable in a lack of purchasing data, such as WTB. However, Moser ([2015](#)) identified the consumers' WTP as the strongest antecedent of green purchasing behavior, meaning that WTP is a focal variable in the research of green consumption and in closing the intention-action gap and ultimately identifying factors that can aid companies in their pricing strategies to limit the risk of market failures. Therefore, investigating variables and mechanisms that can help predict consumers' WTP is highly important and relevant for scholars and practitioners.

A common factor that has been frequently investigated in the literature on sustainable consumption is the consumers' attitudes towards sustainability. When asking consumers to report their sustainable attitudes, their specific attitudes tend to be fragmented across different categories of sustainability, such as food, household, mobility, nature, and social sustainability. However, an issue that is often overseen in the literature is the potential for consumers to overestimate their *actual* attitudes. For example, imagine a consumer that does not actively behave sustainably in his or her daily life, but drives an electric vehicle (EV). Simply owning or driving an EV might make the consumer overestimate his sustainable orientation and attitudes. Thus, investigating consumers' sustainable attitudes in more detail might reveal interesting results that affect their WTP for sustainable products, in addition to their WTB (i.e., purchase intention), which is the most traditional outcome variable in the field.

According to Ajzen & Fishbein ([1977](#)) and Frymier & Nadler ([2017](#), pp. 45-46), research on attitudes within sustainable consumption has yielded highly inconsistent results as attitudes are measured on a general level. This phenomenon is commonly referred to as the attitude-behavior gap. As a result, attitudes have received

less attention over the past decades. Furthermore, they argue that the consumers' attitudes need to be measured with a corresponding level of specificity concerning the attitudinal object, such as purchasing a sustainable product, to consistently predict how attitudes affect an outcome. Thus, a study investigating how general and specific attitudes affect the consumers' WTP and WTB constitutes a novel approach to gathering a deeper understanding of the mechanisms that affect the intention-action and attitude-behavior gap.

Ultimately, considering the aforementioned research gap and WTP being a strong antecedent of consumers' green purchasing behavior, one of the interesting questions that remain unanswered to this date is how the consumers' *general* and *specific* attitudes affect both their WTB and WTP for sustainable products, and whether specific attitudes are better at predicting the outcome.

The thesis is structured as follows. First, a thorough review of the existing literature is discussed, followed by the research question. Next, the conceptual framework and hypotheses are presented, followed by the methodology to answer the hypotheses concerning the research question, the findings, and the subsequent discussion. Furthermore, the limitations of the thesis and suggestions for further research are discussed. Finally, the contributions are presented, followed by the conclusion.

2. Literature review

2.1 Complex human behavior: the inconsistent consumer

In ‘hard science’ such as physics and chemistry, we typically measure what we intend to measure, with statistical models capturing most of the variance observed (Frost, [2022](#)). Relatively speaking, variables are easy to isolate, confounds are easy to account for, and laboratory experiments are realistic and common to implement. For instance, depending on the context, it is not uncommon that if a statistical model achieves an R squared (a measure of how good the model describes the collected data, i.e., the explained variance) below 90%, it is considered a weak model, and might imply that something is wrong (Lemyre, Chalifoux, Desharnais, & Mireault, [2021](#)).

In social science (i.e., ‘soft science’), on the other hand, we rarely achieve high R squares, as human behavior is highly complex, unpredictable, and inconsistent (Ballard, [2019](#); Frost, [2022](#)). Depending on the context, some scholars argue that an acceptable minimum R squared is 10% (Falk & Miller, [1992](#)). The more we aim to isolate variables of interest (for instance, in a laboratory experiment) to achieve higher levels of explained variance, the more unrealistic the overall research setting might be as it becomes artificial. As humans, our behavior is constantly influenced by external and internal stimuli, such as sensory impressions, feelings, mood, needs, and desires, which all impact our behavior, which changes every second, every day, every year, and throughout our lives. Ultimately, our thoughts, meanings, beliefs, and behaviors fluctuate over time.

Typically, we know that eating unhealthy elevates the risk of diseases such as diabetes, heart illness, and cancer. We also know that exercising regularly is good for our health and extends our life expectancy, and that smoking cigarettes significantly increases the risk of severe disease. In fact, estimates suggest that 15% of the global annual deaths are attributed to tobacco (Ritchie & Roser, [2022](#)). Unfortunately, many still do these irrational behaviors regardless of how much we all know that eating unhealthily, not exercising, and smoking cigarettes are harmful to us. According to the World Health Organization, 39% of all adults are considered overweight, 28% do not exercise enough, and nearly 1 in 4 adults smoke tobacco daily (WHO, [2020](#) & [2021](#); Ritchie & Roser, [2022](#)). Ultimately, human behavior is not rational, which makes us unpredictable and complex social beings, where our beliefs and attitudes might not always be consistent with our behaviors.

The more we can predict the consumers’ future behaviors in marketing, the more successful our marketing efforts become. If we were able to predict our consumers’ behavior with a complete success rate, we would be living in a perfect world. (Un)fortunately, that is not the case, which is what makes marketing exciting. Consumer behavior can be defined as the consumers’ direct and indirect activities related to acquiring a product or service and subsequent activities (Jacoby, [2001](#); Cole, [2007](#)). Typically, a consumer’s decision journey starts with an internal or external cue that triggers the recognition of a need. Subsequently, the

consumer searches for information that can help satisfy that need, which might require asking friends and family for advice, searching for information on the internet, and visiting a store for help. When information is in place, the consumer must evaluate all the possible alternatives from his awareness set (all brands he is aware of) and narrow the alternatives down to a consideration set (potential alternatives that are actively considered), then a choice set is arranged (the desired, possible alternatives), and finally, the consumer select the alternative for purchase (Engel, Blackwell, & Kollat, [1978](#); Wolny & Charoensuksai, [2014](#), p. 319). Lastly, post-purchase behavior occurs, including everything from customer service, Word-of-Mouth, and potentially re-purchase, ultimately (and hopefully) enrolling the consumers in the “loyalty loop” (Siebert, Gopaldas, & Lindridge, [2020](#)).

As a result of new technology allowing for new customer experiences and business models, Siebert et al. ([2020](#)) discuss the evolution of a new type of journey, the “sticky customer journey”, which have made consumer behavior even harder to predict. These journeys are offered by companies that purposely propose unpredictable, inconsistent, and exciting customer experiences, such as dating apps (e.g., Tinder, Bumble), CrossFit training, games (e.g., Fortnite, Pokemon Go), Instagram feeds, and so on. Ultimately, consumer behavior has become even more unpredictable and inconsistent over time.

Consumers perform multiple actions, at every step of the customer journey, and every single action is influenced and determined by multiple external and internal stimuli. Psychological factors are strong behavioral influences, such as our attitudes and beliefs, needs, motives, personality, and cognition. These are all influenced by our surroundings, such as our friends and family, the weather, advertisement, and TV. Ultimately, the sole purpose of marketing is to identify as many of these factors as possible that can help us understand the consumers’ next move, which can aid in improving the companies’ offerings and customer experience, thereby providing more value in the eyes of the consumers. Ultimately, identifying factors that can help us better predict future consumer behavior is of high importance for both scholars and practitioners, especially in making consumption greener and limiting the harmful consequences of consumption.

2.2 Sustainable consumer behavior

Consumers increasingly report positive attitudes and intentions toward sustainable products (Park & Lin, [2020](#); Deloitte, [2021](#)). Over the past decades, environmental concerns have received much attention from policymakers and researchers worldwide due to global warming. Additionally, technology increasingly connects the world, making it easier for stakeholders to monitor companies for any injustice and wrongdoing. This has ultimately resulted in policymakers worldwide working together toward establishing common goals to secure sustainable development aimed at ending poverty, protecting the planet, and for everyone to live in peace and prosperity (United Nations Development Programme, [2022](#)). The most recognized definition of sustainable development, made by the Brundtland Commission, is:

“Development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (Kostadinova, [2016](#)).

Overconsumption is one of the significant challenges to achieving sustainable development, as it depletes natural resources, promotes pollution, and, unfortunately, brings many social downsides with it, such as exploitation of labor. We, as consumers, are already expending 30% more resources than the planet can reproduce, and the number is unfortunately accelerating (Kostadinova, [2016](#)). This makes green consumer behavior an important research field to secure sustainable development. Building on the Brundtland report’s definition of sustainable development, Oslo Symposium developed a widely cited definition of sustainable consumption in 1994:

“The use of services and related products which respond to basic needs and bring a better quality of life while minimizing the use of natural resources and toxic materials as well as emissions of waste and pollutants over the life cycle of the service or product so as not to jeopardize the needs of future generations” (Kostadinova, [2016](#)).

Moreover, a distinction between sustainable and traditional products must be made. If we consider the SDGs, sustainable products are those that positively impact one or more goals without significantly influencing others negatively. In a broader context, a product is sustainable if it does not deplete natural and non-renewable resources, does not directly harm the environment, and is made in a socially responsible way (Cyprus, [2020](#)). Traditional products, represent the other side of the coin, where it does not actively consider the SDGs and the latter arguments. However, they can indirectly impact the SDGs positively, although I argue that it is rather uncommon. This is because sustainable products are generally more expensive to produce, thus, making them less attractive if the companies do not have an intention of positively contributing to sustainable development.

Because sustainable consumption is an essential aspect of combating global warming and social injustice, policymakers, practitioners, and researchers have been primarily interested in researching consumers’ purchase intentions and green purchasing behavior. According to Joshi & Rahman’s ([2015](#)) literature review of green consumption since the 2000s, most research has been done by investigating factors that influence purchase intent (i.e., WTB) and purchasing behavior. The most common independent variables are consumer knowledge, norms, environmental concerns, attitudes, demographics, availability, price, purchase intention, and trust (Joshi & Rahman, [2015](#)).

One of the most prominent research topics concerning green consumer behavior has been the attitude-behavior gap, as consumers increasingly report positive attitudes and intentions towards sustainable products; however, purchasing data reveal that the consumers do not follow through. The more we understand the gap and how to bridge it, the more we can secure sustainable development by reducing the harmful effects of overconsumption. Ultimately, we know that consumer behavior is highly irrational,

inconsistent, and hard to predict, and researchers claim that the understanding of the attitude-behavior gap is still scarce; thus, the need for further research on the topic is strong and still of high relevance.

2.3 Categorization of sustainable consumer behavior

To get a deeper understanding of the patterns of consumers' sustainable consumption behaviors, a classification is required. From a consumer behavior perspective, sustainability can be divided into different categories. However, there has been relatively little research investigating them and their individual impacts on the SDGs, even though some are implicit. Nevertheless, I will discuss categories based on the existing literature and their impact on the UN SDGs, and I have identified four main categories.

First and foremost, one of the categories that arguably has the highest impact on the SDGs is *food*. It is estimated that 88 million tons of food go to waste every year in Europe alone, which corresponds to 173 kilograms per capita (European Commission, [2022](#)), making it one of the most urgent areas to improve for securing sustainable development.

Secondly, I have identified the *household category* as an essential category, as it concerns everything that has to do with everyday life within the four walls of our own homes. This includes consumers' choices related to energy and water usage, chemicals used in soaps, laundry detergents, appliances, and furniture. In the U.S. alone, the carbon footprint of household energy usage is estimated to account for 20% of their total greenhouse emissions (Goldstein, Goundaridis, & Newell, [2020](#)). Arguably, it is even worse in other parts of the world that to a more considerable extent employ more environmentally harmful energy sources such as coal, for instance, China and Russia, among others. Arguably, food could be under the household category; however, food has such a significant impact on the SDGs, which makes it appropriate to place it in a separate category.

Moreover, I have identified *mobility* as an essential category. Technology has enabled us to travel more efficiently, although it comes with a cost. Transportation is estimated to account for 24% of the global CO₂ emissions (Ritchie, [2020](#)). Within this category, we find personal transportation, such as driving a car, carpooling, public transportation, electric vehicles, air travel, boating, and others.

Lastly, we have "*other consumer goods*". For instance, the purchase of clothing, makeup, electronics, books, and others. Unfortunately, I have not been successful in finding detailed data about emissions related to different product categories; however, the World Trade Organization ([2021](#)) argues that global trade accounts for 20-30% of the global emissions.

2.4 Attitudes and the attitude-behavior gap

Attitudes are often seen as one of the strongest behavioral influences toward a purchase, as they determine how we *think, feel, and act* toward an attitude object, either in a positive, neutral, or negative way (American Psychological Association, [2022a](#) & [2022b](#); Frymier & Nadler, [2017](#)). The attitude object can be a product,

brand, company, music, artists, people, and so on. From a marketing perspective, a typical attitude object is a product or service itself and its related attributes. A common model for predicting purchasing behavior is the “theory of reasoned action” (TRA), which says that subjective norms and attitudes have a strong influence on consumers’ purchase intentions, which affects purchase behavior (Fishbein & Ajzen, [1975](#)).

However, even though attitudes are considered a strong predictor of behavior, research has shown that the relationship between attitude and behavior tends to be inconsistent, as it depends on multiple factors, such as measurement, perceptions of behavioral control, attitude formation, cognitive processing, and situational factors (Ajzen & Fishbein, [1977](#), p. 899; Frymier & Nadler, [2017](#), p. 45). Ultimately, this gap is commonly referred to as the “attitude-behavior gap”.

One of the most extensive critiques of the early research on attitudes and their effects on behavior is that it tends to be measured vaguely, in general ways. This makes it hard to predict actual behavior, as it tends to be highly fragmented from the “general” measure (Frymier & Nadler, [2017](#)). For example, if we measure someone’s attitudes towards sustainability in a general way, such as “*sustainable development is an important matter to me* (strongly agree – strongly disagree)”, we would, in practice, measure everything from the environment, sustainable food production, mobility (e.g., public transportation, air traffic, electric vehicles), social sustainability (e.g., fair trade, no child labor), and so on, under a single variable. Ultimately, this makes it hard to predict behavior and intentions, as people do not behave in “general” ways. Arguably, general measures are simplifications of reality. According to the principle of aggregation (Ajzen & Fishbein, [2005](#)), general attitudes only measure a behavioral domain (Frymier & Nadler, [2017](#), p. 47), which is the sum of all behaviors within a particular domain, such as sustainability. Arguably, this is also problematic as people might under or overestimate their overall attitude when being asked general questions, as the people in question do not consider all aspects of the particular domain.

Ajzen & Fishbein ([1977](#)), and Frymier & Nadler ([2017](#), pp. 45-46) argue that there should be a corresponding level of specificity between measuring attitudes and behavior to avoid measurement issues, as specific attitudes predict specific behavior. More specifically, Ajzen & Fishbein ([1977](#)) identified four factors that are important to consider when measuring attitudes and behaviors; action (the behavior itself), target (the object that the action is targeted for), context (location, weather, social context, etc.), and time (during the day or night, specific days, events, seasons, etc.). An example would be purchasing (action) green food (target) at the supermarket (context), any time during the day (time; can be explicit or implicit). In addition, Ajzen & Fishbein ([1977](#)) found that the more the levels of the corresponding specificity between the attitudinal and behavioral entities, the attitude-behavior relationship became stronger.

However, even though attitudes have been found to predict behavior, and that recent research has found several factors that can bridge the “attitude-behavior” gap; the gap tends to be strong within green consumption (Morwitz, Steckel, & Gupta, [2007](#); Kostadinova, [2016](#)), which have had researchers over the

years puzzled, trying to identify ways to overcome it (Kostadinova, [2016](#)). Consumers report increasingly positive attitudes towards sustainable products; however, their behaviors do not follow through even though they report a high purchase intention (Park & Lin, [2020](#); Deloitte, [2021](#)). Researchers still believe there is a poor understanding of the attitude-behavior gap and that it requires serious attention to cope with the downsides of overconsumption (Park & Lin, [2020](#)). Factors such as price differences (traditional products vs sustainable products), consumers' experience and knowledge of sustainable products, quality perceptions, and perceived cynicism (perceptions of greenwashing) are possible explanations (Bray, Johns, & Kilburn, [2011](#); Park & Lin, [2020](#)), which are often found to be significant barriers towards purchase (Joshi & Rahman, [2015](#)).

Moser ([2015](#)) investigated the Theory of Planned Behavior (TPB) on consumers' green purchasing behavior and included Willingness-to-Pay as an additional predictor in the model. Moser found that WTP was the strongest predictor of purchasing behavior, meaning that WTP is a focal variable in predicting green purchasing behaviors. Thus, investigating how attitudes can affect consumers' WTP is an interesting question. Ultimately, further research on the attitude-behavior gap, and consequently the intention-action gap, is still essential, as it is still one of the most significant barriers to sustainable consumption. Combining it with WTB and WTP as focal variables will make room for new and interesting research that can enlighten the topic.

2.5 Willingness-to-Pay (WTP)

A price can be defined as the required monetary value set by the seller of a good or service for a transaction to be brought through. When determining a price, the price depends on the interaction of supply and demand (Fernando, Boyle, & Beer, [2021](#)). According to microeconomic theory, monopolists can force consumers to pay high prices due to an excess of demand and lack of supply, which goes at the expense of the consumer surplus, which is the difference between the consumers' reservation price and the actual price (McGuigan, Moyer, & Harris, [2017](#)). On the other hand, in perfectly competitive markets, the price charged equals the company's marginal cost (meaning zero profits), as there is no cannibalization of the consumer surplus (McGuigan et al. [2017](#)). However, perfectly competitive markets do not exist in the real world due to companies' self-interest in earning profits, and monopolistic markets are less common and often regulated by law to protect consumers (McGuigan et al., [2017](#); Hayes, James, & Schmitt, [2022](#)). In other words, most markets are placed somewhere in-between, where prices are influenced by factors such as competition, the consumers' willingness to pay, and companies' strategic goals.

Consumers' Willingness-to-Pay (WTP) can be defined as the maximum price a consumer is willing to pay for a good or service (Bendle, Farris, Pfeifer, & Reibstein, [2015](#); Stobierski, [2020](#)), which is also known as the consumers' reservation price. However, knowing the consumers' WTP can be challenging, as we often rely on survey data or experiments. If we select a price above the consumers' average WTP, we lose many

customers, and if we select a price beneath, we will not maximize profits. In other words, pricing must be done carefully. An important aspect when selecting a price that consumers are willing to pay is their perceptions of price fairness. Arguably, when a price is deemed unfair, it is unlikely that a transaction will take place, especially when competition is low. When consumers are evaluating price fairness, Kahnemann, Knetch, & Thaler (1986) proposed the principle of dual entitlement, which says that firms are entitled to *maintain* profits, and consumers are entitled to *maintain* a price (Urbany, Madden, & Dickson, 1989; Bolton, Alba, & Warlop, 2003). More specifically, consumers deem it fair for a firm to raise the price due to an increase in costs (i.e., maintaining profits), and consequently, it is fair for the firm to maintain the price even if costs are declining, as the consumers still pay the same price (i.e., price is maintained). A classic example in microeconomic theory is the snow shovel example, which says that consumers deem it fair for a company to increase the price of a snow shovel when production costs increase. However, if there is a surge in demand due to a snowstorm, it is deemed highly unfair to increase prices without an increase in cost (Bolton et al., 2003).

Bolton et al. (2003) investigated consumers' perceptions of price fairness further by looking at the cognitive determinants of consumers' price judgments and found that consumers evaluate price fairness based on three different reference points; *past* prices (history), *current* prices (competitors), and the *company's costs*. Their main finding was that consumers generally lack an understanding of prices, including the firm's costs and profits, which influences their perceptions of price fairness. More specifically, (1) when comparing with past prices, consumers tend to underestimate the effects of inflation on price development. Furthermore, (2) when consumers compare prices with competitors, they attribute price differences to profits rather than costs. However, differences in *quality* between competitors reduced perceptions of price unfairness. Lastly, (3) when consumers look *within* the firm to assess costs, they are likely to ignore cost categories that are not directly related to the product (e.g., a firm's service quality), and introducing cues such as cost information reduces perceptions of price unfairness.

The findings of Bolton et al. (2003) are insightful as they showcase how important reference prices are for consumers when evaluating the fairness of a price and highlighting important cognitive determinants of price fairness. With sustainably produced products being more expensive than traditional products, consumers may lack an understanding of the price mechanisms behind and attribute the price to increased firm profits rather than costs, deeming the price unfair. This posts as a barrier against purchase. Ultimately, it emphasizes why research aimed at understanding consumers' WTP for sustainable products is highly important.

Moreover, when consumers are willing to pay more for a product or service compared to those of competitors, the transaction is significantly more profitable. Therefore, companies that bring products perceived to be of higher quality in the market tend to earn more profits (Rao & Bergen, 1992). Prices that

lead to profits above the average are typically defined as *price premiums*; the excess price paid above the average “fair price” for identical products (Rao & Bergen, [1992](#)). Researchers argue that price premiums are the best way to measure brand equity, as it reflects the additional intangible value the brand provides to the product or service itself (Aaker, [1996](#); Anselmsson, Johansson, & Persson, [2007](#); Anselmsson, Bondesson, & Johansson, [2014](#)), and is considered a key metric in assessing pricing (Bendle, Farris, Pfeifer, & Reibstein, [2015](#)).

A more concrete, hands-on definition of a price premium is the percentage of which a product’s price exceeds (or falls short of) a benchmark price (Bendle et al., [2015](#), pp. 226-228), mathematically expressed as: $Price\ premium\ (\%) = \frac{Product\ price\ (\$) - Benchmark\ price\ (\$)}{Benchmark\ price\ (\$)} \times 100\%$. The product price may be substituted by the consumers’ willingness to pay, as firms ideally want the price to be identical to a customer segment’s average WTP (their reservation price) to maximize profitability. Furthermore, four main benchmarks can be used to compute price premiums; we can (1) compare the price of a specified competitor(s), (2) use the average price paid in the category, and (3) use the average price displayed in the category, or (4), use the average price charged in the category (Bendle et al., [2015](#), p. 228).

Moreover, since sustainable products tend to be more expensive due to higher production and operational costs (Mortimer, [2020](#)), consumers are forced to pay a (green) price premium, which is often a significant barrier towards green consumption, as consumers lack the required knowledge to understand why sustainable products are more expensive (Joshi & Rahman, [2015](#)). However, research shows that consumers are indeed willing to pay a price premium for sustainable alternatives in specific product categories, compared to traditional alternatives. For instance, in food categories, Li & Kallas’ ([2021](#)) meta-analysis showed that 29.5% are willing to pay a price premium for sustainable food globally. Additionally, Luchs et al. ([2010](#)) documented that consumers have a stronger preference for sustainable products in categories that are associated with gentleness-related attributes, such as laundry detergents, ultimately implying a higher WTP. However, according to The Global Sustainability Study 2021 by Simon-Kucher & Partners, there are geographical differences in consumers’ WTP for sustainable products (Business Wire, [2021](#)). The same study suggested that 34% of consumers globally are willing to pay a 25% price premium for sustainable products, with younger generations leading the way to pay more and have higher purchase intentions.

Even though some research exists on consumers’ WTP for sustainable products, the scope is still narrow, with most research focusing on food categories, and often niche categories such as wine and fair trade coffee. Additionally, it also seems as if the role of consumers’ WTP for sustainable products within the scope of sustainable consumer behavior is receiving little attention, as I have been unable to identify research on the latter topic in high-ranking marketing journals. In the light of Moser’s ([2015](#)) research, which showed that WTP is a focal antecedent of purchasing behavior, it showcases that further research on the role of consumers’ WTP in bridging the attitude-behavior gap is needed.

3. Research question

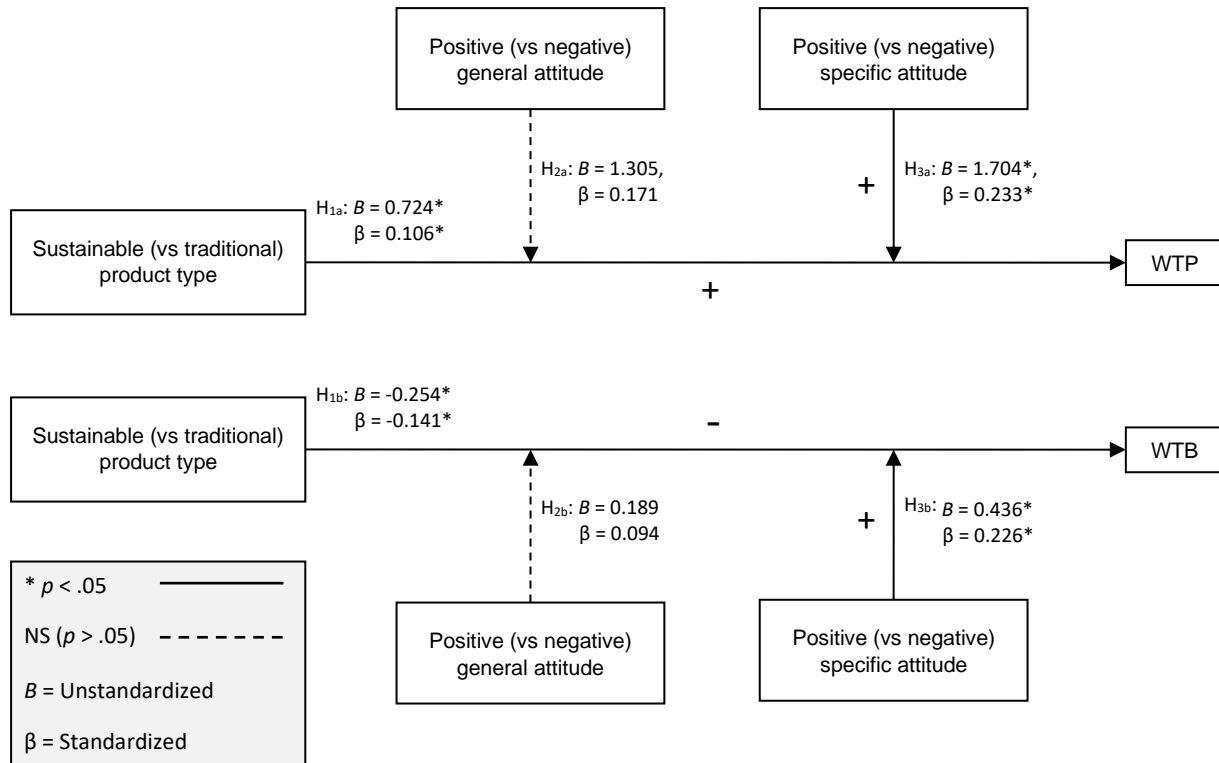
Compared to conventionally produced goods, sustainably produced alternatives such as fair-trade coffee, ecological food (e.g., eggs, milk, wheat, meat), environmentally friendly chemicals (e.g., laundry detergents, soap), and similar, are generally priced higher (Krososky, [2021](#)). Sustainable producers can not exclusively use the most cost-efficient production methods, as they also have to meet an extended set of quality standards with respect to sustainability. Ultimately, consumers are forced to pay a green price premium, where research has shown that consumers are willing to pay more for sustainable products in specific categories.

However, one of the most significant barriers to sustainable behavior is the intention-action gap between consumers' increasingly positive attitudes and intentions towards sustainable products and their actual purchasing behavior. Researchers argue that the understanding of this gap is still scarce. One of the major critiques of research on consumer attitudes is the lack of corresponding levels of specificity between the attitude and the attitudinal domain, which has been proposed to be why research on attitudes has yielded inconsistent results.

Moreover, the consumers' purchase intentions (such as WTB) have historically been the most common dependent variable in the research of sustainable consumption. However, recognizing that the consumers' WTP is considered one of the strongest antecedents of sustainable consumption, research should focus on investigating underlying mechanisms that affect it. To the best of my knowledge, research has yet to discover how the consumers' attitudes on various levels of specificity affect their WTP for sustainable products. Thus, treating the consumers' WTP as a focal dependent variable in the scope of sustainable consumption is an interesting and novel approach, in addition to observing how the consumers' levels of WTB vary across the consumers' reported WTP for sustainable products. Ultimately, the thesis aims to investigate the following research question:

“How do consumers' general and specific attitudes towards sustainability affect their Willingness-to-Pay and Willingness-to-Buy sustainable products? And, are specific attitudes better at predicting the outcomes?”

4. Conceptual framework and hypotheses



As discussed in the body of literature, consumers tend to have a different WTP for sustainable goods, compared to traditional goods. Therefore, it is reasonable to expect that consumers will have a higher WTP for sustainable products when the product categories are associated with gentleness-related attributes, such as laundry detergents and food, in addition to a higher WTB. Ultimately, the first hypotheses are:

- H_{1a} : Sustainable (vs traditional) products has a positive effect on the consumers' WTP ($\beta_1 > 0$).
- H_{1b} : Sustainable (vs traditional) products has a positive effect on the consumers' WTB ($\beta_1 > 0$).

Moreover, consumer behavior tends to be highly unpredictable, inconsistent, and irrational. Thus, it is therefore not likely that there solely exists a direct effect between product type and consumers' WTP and their WTB. Attitudes are generally considered a strong predictor of intentions and future behavior, and consumers' WTP has shown to be a strong antecedent for consumers' purchase intentions toward sustainable products. Hence, it is reasonable to expect that general positive attitudes are able to positively moderate consumers' WTP for sustainable products. This is because general attitudes reflect consumers' attitudes towards a particular attitudinal domain, which in this case is sustainability. Therefore, the subsequent hypotheses are ultimately:

- H_{2a} : Consumers' WTP for sustainable products (vs traditional) increases when having positive (vs negative), general attitudes towards sustainability ($\beta_3 > 0$).
- H_{2b} : Consumers' WTB for sustainable products (vs traditional) increases when having positive (vs negative), general attitudes towards sustainability ($\beta_3 > 0$).

According to the literature review, using general attitudes as a measure has proven controversial as it has yielded highly inconsistent results. By using general attitudes, we are measuring a *general* attitudinal domain, where the more specific attitudes within this domain are fragmented across specific types of sustainable behaviors. For instance, a consumer who reports positive general attitudes might not act sustainable across every aspect within the attitudinal domain, such as recycling, saving water, using green power, paying green price premiums, avoiding fast fashion, and so forth. As Ajzen & Fishbein (1977) and Frymier & Nadler (2017) argued, there must be a corresponding level of specificity to avoid measuring error when aiming to predict intentions and future behavior. Additionally, it is also a possibility that consumers might overestimate their overall attitude towards sustainability when being asked general questions. Ultimately, using specific attitudes should yield greater levels of WTP and WTB for sustainable products. The final hypotheses ultimately become:

- H_{3a}: Consumers' WTP for sustainable products (vs traditional) increases when having positive (vs negative), specific attitudes towards sustainability ($\beta_3 > 0$).
- H_{3b}: Consumers' WTB for sustainable products (vs traditional) increases when having positive (vs negative), specific attitudes towards sustainability ($\beta_3 > 0$).

5. Methodology

5.1 Research approach

To answer the research question and the subsequent hypotheses, an experimental research design is selected as the thesis aims to investigate causal mechanisms affecting consumers' WTP and WTB. Causality makes correlation meaningful, as we aim to prove that one (or more) independent variable(s) is fully or partially causing an effect in a dependent variable. To prove causality, three criteria must be fulfilled: (1) there must be a correlation between the independent variable (product type) and the dependent variable (WTP), (2) the cause must happen before the effect (temporality), and (3) the cause must be the true reason for the effect in the dependent variable (isolation) (Malhotra, [2010](#), pp. 218-220; Monsen, Korgerud, & Wærslund, [2021](#), p. 3).

Two survey-based 2 (sustainable vs traditional product) \times 2 (positive vs negative attitude) between-subjects factorial experiments will be conducted with respect to the causality requirements. Participants will be randomly assigned to one out of two experimental conditions (sustainable vs traditional). Attitudes are not manipulated, however, is measured through a scale, and then divided into positive and negative attitudes based on a median split, which will ultimately represent the second dimension of the experiment. Product type (sustainable vs traditional) is the independent variable (dimension 1), and the consumers' attitude toward sustainability will be treated as the moderating variable (dimension 2). All participants will be measured using general and specific attitudinal measures. Lastly, the consumers' WTP and WTB will be treated as the dependent variables. The reason for selecting household and food categories for the experiment is that they have a significant impact on the SDGs, as discussed in the literature review.

A pilot study will be performed to evaluate the manipulations chosen for the main study and the operationalization of variables, and to determine the minimum sample size. The pilot study is part of achieving the highest possible degree of validity and reliability by minimizing systematic and random error and achieving consistency between the true score and the observed score of the phenomenon, according to the *true score model* (Malhotra, [2010](#), p. 286). A minimum of 30 randomly selected participants will be participating in each experimental condition ($n = 30 \times 4 \times 2 = 240$), as 30 participants are considered a sufficient compromise between statistical power, time consumption, and funding in pilot studies (Isaac & Michael, [1995](#); Hill, [1998](#); Lancaster, Dodd, & Williamson, [2004](#); Malhotra, [2010](#), ch. 12). Principal component analyses (i.e., factor analyses), manipulation checks, as well as the minimum sample size formula will be applied (Sullivan, [2022](#)).

5.2 Sampling strategy

An unrestricted probability sampling technique will be used across the Nordic countries and the UK, and the survey will be distributed through Facebook advertisements to secure an even distribution. Probability sampling is important within research as it is a control measure ensuring that the conclusions made about a

sample are also represented by the population, by holding everything else than the variables of interest constant (Malhotra, [2010](#)). Without randomization, we can not determine whether the phenomenon we observe is simply achieved by chance. Furthermore, the technique treats every individual within the population equally with the same chance of being selected (Sekeran & Bougie, [2016](#), p. 247) and is a way to minimize random and systematic errors. Each participant will be randomly assigned to one experimental condition and participate in one of the two experiments.

The Nordic countries and the UK are selected due to a higher familiarity with their cultures, delimit the study to western countries, and avoiding potential language barriers due to the study being conducted in English. In addition, western countries are generally more concerned with sustainability issues than other parts of the world (World Population Review, [2022](#)), making the research more interesting and relevant for companies and scholars within Western society. Since the main purpose is not to examine geographical and cultural differences in detail across the world, it makes sense to delimit the study since a broader range of countries would require a large, stratified sample consisting of many participants within each stratum to achieve sufficient statistical power for comparative analyses. Furthermore, the minimum sample size formula will be used to determine the minimum sample size required to draw conclusions about the population with a desired level of precision (Volchok, [2020](#); Sullivan, [2022](#)).

5.3 Operationalization

The following section will provide an overview of the operationalization of the variables and manipulations within the experiments. Principal component analyses (PCAs) and manipulation checks are performed with respect to both the pilot and main study to secure the highest possible level of validity and reliability. For the full questionnaire and the survey flow, please see [appendix 1](#).

5.3.1 Product type

The variable “product type” will be a dichotomous variable containing a (1) sustainable vs (0) traditional product. More specifically, the sustainable product will fit the definition discussed in the literature review, in addition to having to be perceived as sustainable by the consumers, which will be controlled by manipulation checks.

Moreover, as previously discussed, there will be conducted two experiments for each of the product categories: household and food. Thus, there will be two different sustainable and traditional products within their respective categories to investigate potential differences across categories. Arguably, the more categories that are investigated the better. However, the reason for limiting the thesis to two categories is due to time and the costs related to the collection of data.

For the *household category*, a laundry detergent will be used. For the sustainable version, ecolabels will be displayed on the bottle to portray the product as sustainable, in addition to the logo containing “organic”. More specifically, two eco-labels which have a broad recognition across Europe will be used. Additionally,

the ecolabels must have relevance for the product chosen for the experiment. The first ecolabel chosen for the sustainable laundry detergent is the Nordic Swan, which is awarded to products that are environmentally friendly, with a special emphasis on the product's energy efficiency, the materials, and chemicals used, as well as having a long shelf life (Nordic Ecolabel, [2022](#)). The second ecolabel will be the EU ecolabel, which has broad recognition both in Europe and worldwide. The EU ecolabel is awarded to products that meet high environmental standards with respect to material extraction, production, distribution, and disposal (European Commission, [2022b](#)). For the traditional version, the environmental cues will be removed, keeping everything else constant. The laundry detergents are illustrated below.

SUSTAINABLE LAUNDRY DETERGENT

TRADITIONAL LAUNDRY DETERGENT



For the *food category*, packaged ground beef will be used. As the purpose of having two different experiments is to compare product categories, the manipulations have to otherwise be as similar as possible. More specifically, the sustainable version will have two ecolabels, similar to the household product. The first ecolabel will be the EU organic logo, which is awarded to products that contain at least 95% organic ingredients and is widely recognized across Europe (European Commission, [2022c](#)). The second ecolabel is the Animal Welfare Approved (AWA) ecolabel which guarantees that the farm animals are raised

outdoors on pasture or range their entire lives, as well as exclusively using sustainable, high-welfare farming practices (A Greener World, [2022](#)). The products are illustrated next.

SUSTAINABLE GROUND BEEF

TRADITIONAL GROUND BEEF



5.3.2 Willingness-to-Pay

As discussed in the literature review, the consumers' WTP equals their reservation price, i.e., the maximum price they are willing to pay for a given product or service. However, self-reports are prone to self-report biases, which disrupt the internal validity of the study (American Psychological Association, [2022c](#)). The social desirability bias is an issue that is frequently discussed in research related to sustainability. Therefore, projective techniques will be used to minimize the risk as much as possible. Instead of referring to the participant him or herself, referring to an average person might mitigate the issue. This is similar to what Bolton et al. ([2003](#)) did in their study of price premiums. Ultimately, the participants will be asked to answer the following question with respect to the product they are presented:

“In the same currency you provided at the start, what is the maximum price you think an average person from your country would be willing to pay for this product? Please use numbers only.”

5.3.3 General attitude

An attitude is an individual's thoughts, feelings, and actions towards an attitude object (sustainability), which can either be positive, neutral or negative (American Psychological Association, [2022a](#) & [2022b](#); Frymier & Nadler, [2017](#)). *General attitudes* measure an *overall* attitudinal domain. The attitudinal domain in this context is sustainability; thus, participants in the study will be asked to provide their attitudes through *general* questions related to sustainability on a 7-point Likert scale, where a value of 1 indicates a very negative attitude, 4 neutral attitude, and 7 a very positive attitude. The questions that are asked to measure general sustainability will be the ones developed by Luchs, Mick, & Haws ([2021](#)) in their study “Consumer

Wisdom for Personal Well-Being and the Greater Good: Scale Development and Validation”, with slight modifications to allow reversed coding:

General sustainability (Luchs et al., 2021)

Please indicate the extent to which you agree or disagree with the following statements:

- I usually buy products from companies that promote environmental responsibility, even when they cost more.
 - My consumption behaviors do *not* consistently reflect my concern for the natural environment.
 - I usually do *not* buy products from companies that demonstrate that they share my ethical values.
 - I spend time thinking about how we, as a global community, affect each other through our individual consumption choices.
-

When the data collection is completed, an index will be aggregated for each participant consisting of their average general attitude towards sustainability, using the participant’s reported attitudes on the 7-point Likert scales as input: $Average\ general\ attitude = \frac{\sum_{i=1}^n x_i}{n} = \frac{\sum_{i=1}^4 General\ attitude_i}{4}$.

Furthermore, when the index is computed, a median split of the indexed variable will be executed in the dataset, which makes it possible to compute a dichotomous variable, which will consist of (1) *positive* general attitude towards sustainability vs (0) *negative* general attitude towards sustainability, which will ultimately be treated as the first moderator (Z) according to the conceptual framework.

5.3.4 Specific attitude

Specific attitudes are, on the contrary to general attitudes, more precisely related to particular aspects within the attitudinal domain (sustainability). For instance, a specific attitude might be aimed at recycling (e.g., “I find recycling important”), reusing shampoo containers through refills (e.g., “I prefer purchasing shampoo refills instead of purchasing a new bottle”), buying locally produced food (e.g., “Locally produced food is a better alternative to me than food that is produced long-distance”), and so on.

An important aspect when measuring specific attitudes is how we measure them. As discussed in the literature review, scholars argue that the reason why we find inconsistencies in the attitude-behavior gap is the failure of properly measuring attitudes, as it requires consistency between the measure and the attitude and behavior itself. In other words, the measurement and the behavior itself have to be closely related to each other. For instance, measuring how concerned consumers are with recycling by asking general questions about sustainability does not suffice. Ultimately, the participants will be asked to provide their attitudes through *specific* questions related to sustainability on a 7-point Likert scale, where a value of 1 indicates a very negative attitude, 4 neutral attitude, and 7 a very positive attitude.

The questions chosen for measuring the participants' specific attitudes are provided by professor Romani (2022). For the purpose of measuring specific attitudes, participants' will report their specific attitudes related to household and food as it provides consistency between the products they are asked to evaluate and the measurement. Attitudes toward sustainable food and household products lie within the attitudinal domain of sustainability. For the questionnaire related to laundry detergents, a series of questions (household sustainability) is asked in question batteries, as well as for the food questionnaire (food sustainability):

Household sustainability (Romani, 2022)

Please indicate the extent to which you agree or disagree with the following statements:

- Usually, I throw all my garbage away in the same waste bin. Reversed coding
- I often throw food away. Reversed coding
- I dispose of empty batteries at dedicated battery collection points.
- I do *not* have green power at home. Reversed coding
- Before going to sleep, I usually do *not* switch off all lamps in my house. Reversed coding
- I always leave devices such as the television on stand-by.
- I save energy by sweeping my house instead of vacuuming.
- I save energy by using as little water as possible.
- In order to save energy, I usually lower the heating in my home.
- I normally do *not* use products in my home that are environmentally friendly. Reversed coding

Food sustainability (Romani, 2022)

Please indicate the extent to which you agree or disagree with the following statements:

- I *rarely* purchase food that is obtained in an environmentally friendly way. Reversed coding
- Food that is produced in a way that respects biodiversity is important.
- Food should *not* be grown using sustainable agricultural practices. Reversed coding
- Food production should respect animal welfare.
- Food should be produced without the use of pesticides. Reversed coding
- Low carbon emissions do *not* matter for food production. Reversed coding
- Food should be produced in an unspoiled environment (e.g., should not use chemicals).
- Food waste is a *natural* part of food production. Reversed coding
- It is important that food is packaged in an environmentally friendly way.
- I do not mind paying more for eco-friendly food.
- Food must be produced in respect of human rights.

- Food must be sold at a fair price for the producer.
- It is *not* important that the food keeps me healthy. Reversed coding

Similar to the general attitude, two indexes will be aggregated for each participant consisting of their average specific attitude towards sustainability in the household, and their average specific attitude, towards food sustainability, using the participant’s reported attitudes on the 7-point Likert scales as input:

$$(1) \text{ Average specific household attitude} = \frac{\sum_{i=1}^n x_i}{n} = \frac{\sum_{i=1}^{10} \text{Specific household attitude}_i}{10}$$

$$(2) \text{ Average specific food attitude} = \frac{\sum_{i=1}^n x_i}{n} = \frac{\sum_{i=1}^{13} \text{Specific food attitude}_i}{13}$$

When the indexes are computed, a median split of each of the averages will be executed, and then create another dichotomous variable consisting of (1) *positive* specific attitude toward sustainability vs (0) *negative* specific attitude toward sustainability for both food and household attitudes.

5.3.5 Willingness-to-Buy

Willingness-to-Buy can be defined as the extent to which a consumer is willing to buy a given product or service (Lu & Hsee, 2019). Using the same projective techniques discussed for WTP, each participant will be asked how likely they think it is that an average person from his country would purchase the product. Ultimately, participants will be asked, on a scale of 1-7, the following questions, developed by Dodds, Monroe, & Grewal (1991) in their study “Effects of price, brand, and store information on buyers’ product evaluations”, with slight modifications to allow projective techniques to minimize the social desirability bias:

Willingness-to-Buy

Item	7-point Likert scale
Please provide your answers to the statements below:	
- The likelihood of an average person from my country to purchase the product is:	Very low – Very high
- The probability that an average person from my country would consider buying the product is:	Very low – Very high
- An average person from my country’s willingness-to-buy the product is:	Very low – Very high
- An average person from my country would consider buying the product.	Strongly disagree – Strongly agree
- If an average person from my country was looking to buy a new laundry detergent, he/she would consider buying the one shown to me.	Strongly disagree – Strongly agree

5.3.6 Manipulations

Study 1: Household category

ATTITUDE

		Positive	Negative
PRODUCT TYPE	Sustainable	Sustainable laundry detergent shown to a participant with positive attitude toward sustainability	Sustainable laundry detergent shown to participants with negative attitude toward sustainability
	Traditional	Traditional laundry detergent shown to a participant with positive attitude toward sustainability	Traditional laundry detergent shown to a participant with negative attitude toward sustainability

Study 2: Food category

ATTITUDE

		Positive	Negative
PRODUCT TYPE	Sustainable	Sustainable ground beef shown to participants with positive attitudes toward sustainability	Sustainable ground beef shown to participants with negative attitudes toward sustainability
	Traditional	Traditional ground beef shown to participants with positive attitudes toward sustainability	Traditional ground beef shown to participants with negative attitudes toward sustainability

Each cell of the experimental matrices represents each of the manipulations aimed at the participants. In addition to the products that have been described in section ‘[5.3.1 Product type](#)’, participants will be presented with a short text to secure a stronger distinction between the sustainable and traditional products. More specifically, depending on the condition, participants will be presented with the following texts simultaneously with the product that is displayed:

Household category

Sustainable

The following laundry detergent, Go, contains 1 liter of product, which equals to 28 uses, and the bottle cap works as a measuring cup. The laundry detergent is recognized by the EU Ecolabel and the Nordic Ecolabel for being sustainably produced and Co2 neutral. All ingredients are organic and eco-friendly.

Traditional

The following laundry detergent, Go, contains 1 liter of product, which equals to 28 uses, and the bottle cap works as a measuring cup.

Food category

Sustainable

The following package contains 400 grams of lean, fresh, organic ground beef. In addition to being certified organic, it is animal welfare approved by AGW.

Traditional

The following package contains 400 grams of lean, fresh ground beef.

5.3.6.1 Manipulation checks

A manipulation is a change in the experimental environment. More specifically, they are altercations of one or more independent variables, either individually or simultaneously, while holding everything in the

environment constant. These manipulations are also known as the experimental conditions (i.e., each cell within the experimental matrix).

To increase validity, manipulation checks will be conducted in the pilot study in order to verify whether the manipulations are sufficiently developed. More specifically, a manipulation is successful if the participant has successfully perceived, comprehended, and/or reacted to the manipulation in question (Hoewe, [2017](#)). Knowing whether the manipulation is successfully developed increases validity as it enables us to rule out the manipulation itself as a possible error if the independent variable (or interaction of multiple IVs) has an insignificant impact on the dependent variable. Likewise, a failed manipulation makes it possible to improve the manipulation so that it is successfully perceived, comprehended, and/or reacted to by the participant.

With respect to the manipulations that are developed, there is no need to perform manipulation checks of the participants' attitudes, as they are inherent psychological factors. In other words, they are not altered by the experiment. However, manipulation checks will be performed with respect to the product type (sustainable vs traditional). The manipulation checks are successful if they are perceived correctly in terms of being either sustainable or traditional. Since there are two different product categories, there will be asked two questions to check the manipulations.

Ultimately, with respect to the manipulation check of the *household category*, the participants will be asked to report on a scale of 1 (very unsustainable) to 7 (very sustainable) the following question:

“When you reviewed the laundry detergent, to what extent did you perceive it to be sustainable or unsustainable?”

Moreover, with respect to the manipulation check of the *food category*, the participants will be asked the following question:

“When you reviewed the laundry detergent, to what extent did you perceive it to be sustainable or unsustainable?”

The manipulations check out as successful if the participants that are within the traditional condition score significantly lower on the manipulation check compared to the participants that are within the sustainable condition. A two-sample t-test will be used for this purpose.

5.4 Questionnaire

For the full detailed questionnaire and survey flow, see [appendix 1](#). The questionnaire and experiments are developed in Qualtrics and will consist of forced responses and randomization of questions. Participants will be randomly assigned to one out of two possible experimental conditions, whereas their attitudes will represent the other two conditions (positive vs negative), and will participate in one experiment each. For

the manipulations, participants can not proceed until 20 seconds have gone by to ensure that all participants have fully perceived the stimulus. Additionally, attention checks are included in the questionnaire to validate that the participants are paying attention to increase validity. Lastly, control variables are included, such as whether the participants consume meat, their knowledge of sustainability, as well as how much they liked the products that were presented to them.

Before starting the survey and experiment, the participants will be briefed about (1) the study overview, (2) confidentiality and anonymity, (3) how the data is processed, (4) and that they have to give their informed consent to participate in the study, all in accordance with the General Data Protection Regulation. To avoid social desirability bias, full anonymity is provided and is informed in the pre-briefing. After the experiment, the participants will be asked to report their WTP and WTB. After this, the participants will move on to report their demographics. The reason for obtaining the participants' demographics before measuring their attitudes is that it creates some space between the experiment and the questions related to attitudes, as it could potentially jeopardize the study purpose, ultimately increasing the risk of social desirability bias in their responses.

Moreover, the pre-briefing will not reveal information that can reveal the purpose of the study to avoid possible self-report bias. However, participants will be briefed about the study's purpose when finished. Furthermore, to incentivize participation, participants can participate in a draw for a €100 Amazon gift card.

The post-briefing will provide details about the study, and participants that wish to receive the thesis by e-mail or wish to participate in the draw of the gift card will be forwarded to an external document to avoid jeopardizing their anonymity.

5.5 Pilot study

When distributing the pilot study, an unexpected issue occurred. The initial strategy for distributing the survey was to use Facebook advertisements; however, over the course of the first week of the pilot, suspicions of fraudulent responses in terms of survey bots and possibly fraudulent professional survey takers were raised. The total sample size for the pilot ended up on $n = 257$ before rinsing, whereas ten responses were removed due to failed attention checks, two responses were removed due to severely failing the manipulation checks, and 212 responses were removed due to a strong suspicion of fraudulent behavior, such as survey bots. For instance, these responses had multiple illogical and contradicting responses and had approximately the same start date and timing, as well as relatively short durations for completion. Ultimately, the sample size for the pilot study ended up at $n = 33$ after rinsing the data, which is unfortunate as it is highly unlikely to be representative. However, the findings of the pilot will be used to support subjective a-priori determinations and my intuition for improvements in the main study. Nevertheless, I

will run the same analyses in the main study to confirm whether the determinations and decisions made based on the pilot study are correct.

5.5.1 Manipulation checks

To test whether the manipulations of sustainable vs traditional product type is adequately developed and perceived, two independent samples t-tests are performed using the sustainable (vs traditional) product type as a grouping variable, for each experiment (household category – sustainable vs traditional laundry detergent; food category – sustainable vs traditional ground beef).

5.5.1.1 Household category

H_a: The sustainable laundry detergent is perceived as more sustainable compared to the traditional laundry detergent ($\mu_{SUSTAINABLE} > \mu_{TRADITIONAL}$).

H₀: The sustainable and traditional laundry detergents are perceived as equally (un)sustainable ($\mu_{SUSTAINABLE} = \mu_{TRADITIONAL}$).

Levene's test of Equality of Variances was non-significant at a 95% confidence level, $F(1, 14) = 1.984, p = .181$, thus, equal variances are assumed. The t-test was significant at a 95% level, $t(14) = 4.221, p < .001$. Ultimately, H₀ is rejected, the sustainable laundry detergent ($n = 10, M = 5.5, SD = .707$) is perceived as more sustainable than the traditional laundry detergent ($n = 6, M = 3.33, SD = 1.366$), with a mean difference of 2.17.

5.5.1.2 Food category

H_a: The sustainable ground beef is perceived as more sustainable than the traditional ground beef ($\mu_{SUSTAINABLE} > \mu_{TRADITIONAL}$).

H₀: The sustainable and traditional ground beef are perceived as equally (un)sustainable ($\mu_{SUSTAINABLE} = \mu_{TRADITIONAL}$).

Levene's test of Equality of Variances was non-significant at a 95% confidence level, $F(1, 15) = .027, p = 0.872$, thus, equal variances are assumed. The t-test was significant at a 95% confidence level, $t(15) = 1.934, p = .036$. Ultimately, H₀ is rejected, the sustainable laundry detergent ($n = 8, M = 5.63, SD = 1.408$) is perceived as more sustainable than the traditional laundry detergent ($n = 9, M = 4.22, SD = 1.563$), with a mean difference of 1.41.

5.5.2 Principal Component Analyses (PCA)

In the data, I will run three Principal Component Analyses (PCA) with the Varimax rotation method to control operationalization. Since two of the components (household attitude and food attitude) belong to two different experimental conditions, it is not possible to run the analysis in one PCA as there are missing data depending on which experiment the participants belonged to. Additionally, running two analyses containing general attitude and household attitude, as well as general attitude and food attitude, may not be

a good indication of factors, as it is expected that the general attitude will have some overlap with the more specific attitude measures. Therefore, three PCAs containing each of the three attitude dimensions are performed (general attitude, household attitude, and food attitude).

To know whether a PCA is appropriate, Bartlett's Test of Sphericity is performed for the three PCAs. The test containing the general attitudes was significant at the 95% confidence level, approximate $\chi^2(43.2, 6)$, $p < .001$, meaning that not all correlation is equal to 0. Additionally, Kaiser-Mayer-Olkin Measure of Sampling Adequacy (KMO) = .63, which is larger than .5, also indicating that the PCA is appropriate. The test containing the household attitudes was significant at the 95% confidence level, approximate $\chi^2(100.2, 45)$, $p < .001$, which means that not all correlation is equal to 0. Additionally, KMO = 0.502 which is larger than .5. The test containing the food attitudes was significant at the 95% confidence level, approximate $\chi^2(125.7, 78)$, $p < .001$, which means that not all correlation is equal to 0. However, KMO = 0.392, which is smaller than .5. Nevertheless, it is difficult to rule out whether it is due to the inadequate sample size. Ultimately, considering that five out of six tests are significant, I argue that it is appropriate to perform all three PCAs.

5.5.2.1 PCA: General attitude

In the first PCA, containing 4 questions related to general attitudes, the scree plot indicates one or two factors. According to Kaiser's criterion, only Eigenvalues ≥ 1 should be kept. Factor 1 has an Eigenvalue of 2.12 ($R^2 = 52.91\%$), and factor 2 has an Eigenvalue of 1.037 ($R^2 = 25.91\%$). In the rotated component matrix (Varimax), all variables belong to the same factor, except the question "*I usually do not buy products from companies that demonstrate that they share my ethical values*", which suggests two factors. However, the wording of the question was reversed, which might be the reason, considering the small sample size. Luchs et al. (2021), the authors that created the scales (not including any reversed coding), also did a PCA of these variables with an adequate sample size and found one clear dimension. Therefore, I argue that all questions belong to the same factor, and I will re-operationalize the question to a regular (unreversed) scale when conducting the main study.

5.5.2.2 PCA: Household attitude

For the second PCA, containing ten questions related to household attitudes, the scree plot clearly indicates one factor. Factor 1 has an Eigenvalue of 3.993 ($R^2 = 39.93\%$), factor 2 an Eigenvalue of 1.521 ($R^2 = 15.21\%$), factor 3 an Eigenvalue of 1.331 ($R^2 = 13.32\%$), factor 4 an Eigenvalue of 1.146 ($R^2 = 11.46\%$), and the rest of the factors has Eigenvalues < 1 . Since the increase in explained variance becomes relatively small after the first factor, I argue that it indicates one factor. The rotated component matrix (Varimax) was a bit more unclear to interpret; however, I will ultimately treat the variables as one factor based on the latter arguments. Five out of ten questions contain reversed coding, and I argue that it might be a bit tiring for

participants as it requires much more attention and concentration; thus, I will reduce the reversed coded questions to only two questions in the main study.

5.5.2.3 PCA: Food attitude

For the third and final PCA, containing 13 questions related to food attitudes, the scree plot indicates one factor; however, the plot is harder to interpret than in the latter analyses. Factor 1 to 5 has Eigenvalues >1 ; however, only factor 1 has a significantly larger explained variance than the rest of the factors ($R^2 = 26\%$), whereas factor 2 has 16.33%, and factor 3 has 13.59%. The rotated component matrix is difficult to interpret. Arguably, there could be two factors, however, five out of thirteen questions contain reversed coding. Since the question battery contains many questions, the number of reversed scales might be too much and tiring. Ultimately, the KMO criterion for the PCA was not met, and the sample size is small; therefore, the results of the analysis should be interpreted cautiously. Based on a-priori determination, I argue that there exists only one factor. However, I will only use two reversed scales in the main study, as I suspect it might be one of the reasons that the analysis was relatively hard to interpret.

5.5.3 Discussion

A major limitation of the pilot study is arguably the inadequate sample size resulting from fraudulent responses and the difficulty of gathering enough participants through the initial distribution strategy with Facebook advertisements. Nevertheless, the dataset was rinsed under strict and thorough revision and yielded $n = 33$. The data indicate that the manipulations were adequately perceived by the participants, with the household manipulations having the biggest mean difference ($M_D = 2.17$) over the food manipulations ($M_D = 1.403$). Considering that there are two separate experiments, where the ideal sample size would be approximately 100 participants within each experimental condition, an approximate sample size for the main study would be $8 \times 100 = 800$. Furthermore, with the issues I encountered during the distribution of the pilot, limiting the study to only one experiment might be a better, more realistic, and feasible approach to gather enough data – in addition to changing the distribution strategy from using Facebook advertisements, to Prolific. Since the household manipulations had the strongest distinction in the perceptions of sustainable vs traditional products and the household manipulations seemed to be better operationalized according to the PCAs, I decide to remove the food category experiment in the main study. Additionally, the number of reversed scales will be reduced to approximately 20% in the main study, as the number of reversed scales in the pilot study was arguably too many, potentially contributing to fatigue as it requires considerably more attention and concentration from participants. Please see [appendix 2](#) for the new questionnaire and survey flow for the main study.

Next, I will compute the minimum sample size for the main study based on the findings from the pilot, where I will use the data from the household experiment as input.

5.5.4 Minimum sample size

Given a large population, the minimum sample size is derived by: $n = \left(\frac{Z\sigma}{E}\right)^2$, which must be multiplied by 4 due to four experimental conditions within the experiment: $n = \left(\frac{Z \times s_{WTP}}{E}\right)^2 \times 4$. With a confidence level of 95% ($Z = 1.96$), allowing for a ± 0.9 EUR margin of error, we get: $n = \left(\frac{1.96 \times s_{WTP}}{0.9}\right)^2 \times 4$. One response in the pilot study was a significant outlier, and due to the small sample size in the pilot, the reported WTP was removed from the analysis ($n = 31$). The pilot study yielded $M_{\text{HOUSEHOLD WTP}} = 6.4292$ ($SD = 3.43341$), resulting in a minimum sample size of: $n = \left(\frac{1.96 \times 3.43341}{0.9}\right)^2 \times 4 = 7.477204^2 \times 4 = 223.63 \approx 224$. Ultimately, the minimum sample size in the main study is $n = 224$.

5.6 Main study

5.6.1 Data rinsing

The distribution of the main study yielded an initial sample size of $N = 274$.

5.6.1.1 Excluded responses

To increase the validity of analyses, responses that fail certain criteria are excluded from the dataset. The first criterion is that the responses need to pass attention checks. If participants fail at least two attention check, they are excluded ($n = 2$). Additionally, responses that fail one attention check in combination with a completion time below 5 minutes are also excluded ($n = 17$). Lastly, there were two extreme outliers (Z -score > 3) in one of the dependent variables (WTP), and these responses were also excluded. Ultimately, the final sample consists of $N = 253$, which satisfies the minimum sample size (224).

5.6.2 Descriptive statistics

Overall descriptive statistics

Variables	<i>M</i>	<i>SD</i>	<i>N</i>	Max	Min
WTP	6.429	3.433	253	23.76	1.17
WTB	5.025	0.905	253	7.0	1.8
General attitude	4.07	1.195	253	7	1
Specific attitude	4.98	1.366	253	7	1
Age	36.79	12.58	253	72	18
Household income (€)	49 225 ($\bar{x} = 41\ 300$)	43135	253	466100	1888
Gender					
Male			70 (27.7%)		
Female			179 (70.8%)		
Nationality					
The UK			178 (70.4%)		
The Nordics			30 (11.9%)		
Other			45 (17.8%)		
Educational level					
High school diploma (or equivalent)			49 (19.5%)		
Some university / college credits (no degree)			42 (16.7%)		
1 year of higher education			13 (5.2%)		
Bachelor's degree			96 (38.2%)		

Master's degree	43 (17.1%)
Doctorate degree	8 (3.2%)
Employment status	
Working full-time	120 (47.6%)
Working part-time	57 (22.6%)
Unemployed	7 (2.8%)
A homemaker or stay-at-home parent	15 (6%)
Student	33 (13.1%)
Retired	14 (5.6%)
Other	6 (2.4%)
Marital status	
Married	92 (36.4%)
Living with a partner	60 (23.7%)
Widowed	2 (0.8%)
Divorced / separated	10 (4%)
Never been married	89 (35.2%)

5.6.3 Validity and reliability

According to Malhotra (2010, p. 286), the true score model is a framework for understanding the accuracy of measurement: $X_O = X_T + X_S + X_R$, where X_O = observed value of measurement, X_T = true value of measurement, X_S = systematic error, and X_R = random error. In every measurement, we have systematic error that is due to errors (i.e., noise) that can, in fact, be controlled by researchers by the methodological approach, such as measurement errors, bias, poor operationalization, and so on. Random error, on the other hand, can not be controlled directly, as every measurement has some sort of random error. It can, however, be reduced through randomization as well as merging several common measures of a construct into one common scale. The observed value is simply the value we observe, and the true value is the true value that we aim to observe. Perfect validity and reliability are according to the true score model, defined as achieving a perfect balance between the observed value and the true value: $X_O = X_T$.

In terms of reliability, a measurement is reliable when the measurement produces consistent results over time. In other words, the observed value becomes more reliable the smaller the random error becomes. In terms of validity, we achieve perfect validity when there is no difference between the observed value and the true value; in other words, no error (random error and systematic error): $X_O = X_T$, $X_S = 0$, $X_R = 0$. Ultimately, when we have perfect validity, we also have perfect reliability (Malhotra, 2010). A series of control measures and tests can be brought through to assess the overall validity and reliability of the findings, in addition to a-priori determinations. In this case, manipulations checks, assessing the operationalization through principal component analyses (PCA), and Chronbach's alpha will be used to determine the overall reliability and validity.

5.6.3.1 Manipulation check

Similar to the pilot study, a manipulation check using a two-sample t-test of the condition (sustainable laundry detergent vs traditional) is performed. This is to assess the construct validity (internal validity) of the study. The following hypotheses are tested:

H_a: The sustainable laundry detergent is perceived as more sustainable compared to the traditional laundry detergent ($\mu_{SUSTAINABLE} > \mu_{TRADITIONAL}$).

H₀: The sustainable and traditional laundry detergents are perceived as equally (un)sustainable ($\mu_{SUSTAINABLE} = \mu_{TRADITIONAL}$).

Levene's Test for Equality of Variances is non-significant at the 95% level, $F(1, 256) = 1.697, p = .194$, thus, equal variances are assumed. The two-samples t-test is significant at the 95% level, $t(256) = 10.524, p < .001$, thus, the null-hypothesis is rejected. The sustainable laundry detergent ($M = 5.56, SD = 1.092$) is perceived as more sustainable compared to the traditional laundry detergent ($M = 4.09, SD = 1.109$), with a mean difference of ± 1.47 . Ultimately, the manipulation of the sustainable laundry detergent is perceived correctly by the participants.

5.6.3.2 Principal Component Analyses

Bartlett's Test of Sphericity was statistically significant for all three scale dimensions; WTB, general attitudes, and specific attitudes ($p < .001$). Ultimately, running the PCAs is appropriate.

5.6.3.2.1 PCA: Willingness-to-Buy

The PCA, using the Varimax method with factor solutions based on Eigenvalues ≥ 1 , ended up extracting one dimension. This single factor accounted for 77.48% of the total variance, with an Eigenvalue of 3.874. The next factor had an Eigenvalue of 0.526. The scales had a Chronbach's alpha of 0.927, indicating that the scale is highly reliable. Ultimately, merging the scales into an average scale, representing one dimension, is considered appropriate. The average will represent the participants' WTB. The following table represents component matrix and the corresponding factor loadings:

Component matrix

<i>x_i</i>	Item	Component 1
<i>x₁</i>	The likelihood of an average person from my country to purchase the product is:	.909
<i>x₂</i>	The probability that an average person from my country would consider buying the product is:	.917
<i>x₃</i>	An average person from my country's willingness-to-buy the product is:	.897
<i>x₄</i>	An average person from my country would consider buying the product:	.888
<i>x₅</i>	If an average person was looking to buy a new laundry detergent, he/she would consider buying the one shown to me:	.784

Extraction method: Varimax, based on Eigenvalues ≥ 1 . Correlations smaller than $\pm.35$ are suppressed.

5.6.3.2.2 PCA: General attitudes

The factor analysis, using the Varimax method, extracting factor solutions based on Eigenvalues ≥ 1 , suggested one dimension. This single factor accounts for 62.83% of the total variance, with an Eigenvalue of 2.513. The next factor has an Eigenvalue of 0.815. The scales have a Chronbach's alpha of 0.786, with none of the measurements having a coefficient below 0.6. Ultimately, I conclude that general attitudes are properly operationalized and that we have a high degree of internal validity in terms of construct and content validity for this dimension, and the Chronbach's alpha suggests that we have a satisfactory degree of reliability. The following table represents the component matrix and the corresponding factor loadings:

Component matrix

<i>x_i</i>	Item	Component 1
<i>x₁</i>	I usually buy products from companies that promote environmental responsibility, even when they cost more.	.891
<i>x₂</i>	My consumption behaviors consistently reflect my concern for the natural environment.	.548
<i>x₃</i>	I usually buy products from companies that demonstrate that they share my ethical values.	.889
<i>x₄</i>	I spend time thinking about how we, as a global community, affect each other through our individual consumption choices.	.793

Extraction method: Varimax, based on Eigenvalues ≥ 1 . Correlations smaller than $\pm.35$ are suppressed.

The scales are merged into an average scale that will represent general attitudes. Next, a median split (median = 5) is performed to divide the scale into positive (= 1) vs negative (= 0) general attitudes towards sustainability.

5.6.3.2.3 PCA: Specific attitudes (household sustainability)

The initial factor analysis of the measures of specific attitudes (household) using Varimax rotation suggests that there exist 4 dimensions, according to both the scree plot and the Eigenvalues (>1), which accounts for 59.55% of the explained variance. However, while interpreting the rotated component matrix, it seems as if two dimensions are the easiest interpretable as they are more distinctive, suggesting a dimension related to *energy usage*, and one related to *consumption and waste reduction*. However, the coefficients seem to have highly divergent correlations, even when forcing various numbers of pre-defined factors, implying that the scale is not specific enough and that we fail to operationalize the scales adequately. This is the case, particularly in terms of achieving consistency in the specificity between the attitudes and the attitudinal object (using a sustainable laundry detergent). The following table represents the rotated component matrix with 4 factors, based on Eigenvalues >1 (coefficients smaller than ±0.35 are suppressed):

Rotated component matrix

x_i	Item	Component			
		1	2	3	4
x_1	Usually, I throw all my garbage away in the same waste bin.	.399	.354		-.637
x_2	I often throw food away.	.570			
x_3	I dispose of empty batteries at dedicated battery collection points.	.722			
x_4	I have green power in my home.	.518		.440	
x_5	Before going to sleep, I usually switch off all the lamps in my house.			-.616	
x_6	I normally leave devices such as the television on stand-by.			.787	
x_7	I save energy by sweeping my house instead of vacuuming.				.795
x_8	I save energy by using as little water as possible.		.752		
x_9	In order to save energy, I usually lower the heating in my home.		.855		
x_{10}	I normally use products in my home that are environmentally friendly.	.682			

Extraction method: Varimax, based on Eigenvalues ≥ 1 . Correlations smaller than ± 0.35 are suppressed.

The scale chosen for the study was intended to represent specific attitudes related to the household. However, according to the PCA, it appears to represent four dimensions, which does not seem to be closely related to using sustainable laundry detergents, which was unfortunate. Arguably, out of all the scales and potential dimensions, I argue that x_{10} might be the most representative scale item that is the most closely linked in terms of specificity to the attitudinal object, which is to use an environmentally friendly laundry detergent.

Chronbach's alpha is one of the most common measures of internal consistency reliability, with the coefficients telling us how closely related the scale items are in terms of representing a common dimension. Considering that only one of the items seems to represent the attitudinal object, the Chronbach's alpha is arguably not necessary; however, it will give us an overall idea of how reliable the operationalized scales are. According to Malhotra (2010, p. 287), a Chronbach's alpha below 0.6 is generally considered as unsatisfactory. Chronbach's alpha was 0.526, meaning that we, unfortunately, have unreliable scales, decreasing the likelihood of reproducing the same observed values over time. Every item was still below 0.6 if deleting specific items. This emphasizes the importance of consistency in the specificity between the attitudes we measure and the attitudinal object. More specifically, one of the limitations of the study, was unfortunately the inability to operationalize the variables adequately.

Ultimately, I conclude that the measures of specific attitude have a poor validity and reliability; however, I will use x_{10} as the moderator for further analyses, representing the participants' *specific* attitudes towards sustainability. Next, a median split (median = 5) is performed to divide the scale into positive (= 1) vs negative (= 0) specific attitudes towards sustainability.

5.6.4 Group statistics

Grouped descriptive statistics of focal variables

Independent variables		Dependent variables					
		WTP ^a			WTB ^b		
Product type		<i>M</i>	<i>SD</i>	<i>N</i>	<i>M</i>	<i>SD</i>	<i>N</i>
Sustainable		6.793	3.561	126	4.897	0.856	126
Traditional		6.069	3.286	127	5.151	0.937	127

Independent variables		Dependent variables					
		WTP ^a			WTB ^b		
Product type	General attitude	<i>M</i>	<i>SD</i>	<i>N</i>	<i>M</i>	<i>SD</i>	<i>N</i>
Sustainable	Positive	7.422	4.038	71	4.983	0.885	71
	Negative	5.980	2.653	55	4.786	0.813	55
Traditional	Positive	6.129	3.085	71	5.155	0.867	71
	Negative ^c	5.992	3.529	56	5.146	1.028	56

Independent variables		Dependent variables					
		WTP ^a			WTB ^b		
Product type	Specific attitude	<i>M</i>	<i>SD</i>	<i>N</i>	<i>M</i>	<i>SD</i>	<i>N</i>
Sustainable	Positive	7.238	3.880	82	5.022	0.833	82
	Negative	5.963	2.740	44	4.664	0.860	44
Traditional	Positive	5.910	3.030	80	5.123	0.993	80
	Negative ^c	6.339	3.674	47	5.200	0.842	47

^aWillingness-to-Pay (WTP) is expressed on a continuous scale, from 0 to $+\infty$.

^bWillingness-to-Buy (WTB) is expressed on a scale of 1-7, where 7 is very likely to buy, and 1 is very unlikely.

^cReference group for sustainable product type \times positive attitude

According to the group descriptives, positive, sustainable attitudes generally seem to have the highest levels of WTP for sustainable products. Additionally, sustainable attitudes appear to be marginally negative for the participant's WTB sustainable products when compared to the mean of the reference groups, which is a bit surprising, implying that the hypotheses related to WTB might be statistically insignificant and that we, on the other hand, might observe some negative effects. Ultimately, this implies that consumers, in general, are less likely to purchase the sustainable products, regardless of having a positive attitude towards sustainability. Lastly, the group sizes are adequately proportional for statistical analyses.

6. Findings

6.1 Overview

The following table provide a brief overview of the findings and hypotheses. Even though many of the hypotheses were statistically insignificant, there were, however, significant negative effects, as indicated in the table. For the hypotheses with no significant positive or negative effects on the dependent variable, no price premium and WTB premium is provided. The premiums are computed by the definition provided in the literature review, and are interpreted as the % premium of the sustainable product (and positive general/specific attitude for the moderator hypotheses), relative to the reference group; the traditional product (and negative general/specific attitude for the moderator hypotheses).

Overview of findings

Hypotheses		Method	Confidence level: 95%	Price premium %	WTB premium %
H _{1a} :	Sustainable (vs traditional) products has a positive effect on the consumers' WTP.	Simple linear regression	Sig. positive effect ($B_1 = .724$ $p = .047$)	11.93%	
H _{1b} :	Sustainable (vs traditional) products has a positive effect on the consumers' WTB.	Simple linear regression	NS positive effect ($B_1 = -.254$ $p = .9875$) Sig. negative effect.		-4.93%
H _{2a} :	Consumers' WTP is greater for sustainable products (vs traditional) when having positive (vs negative), <i>general</i> attitudes towards sustainability.	Multiple linear regression	NS ($B_3 = 1.305$ $p = .066$)	N/a	
H _{2b} :	Consumers' WTB is greater for sustainable products (vs traditional) when having positive (vs negative), <i>general</i> attitudes towards sustainability.	Multiple linear regression	NS ($B_3 = .189$ $p = .204$)		N/a
H _{3a} :	Consumers' WTP is greater for sustainable products (vs traditional) when having <i>positive</i> (vs negative), <i>specific</i> attitudes towards sustainability.	Multiple linear regression	Sig. positive effect ($B_3 = 1.704$ $p = .0285$)	$\Delta 2.24\%$ 14.17%	
H _{3b} :	Consumers' WTB is greater for sustainable products (vs traditional) when having <i>positive</i> (vs negative), <i>specific</i> attitudes towards sustainability.	Multiple linear regression	Sig. positive effect ($B_3 = .436$ $p = .032$)		$\Delta 1.53\%$ (-3.40%)

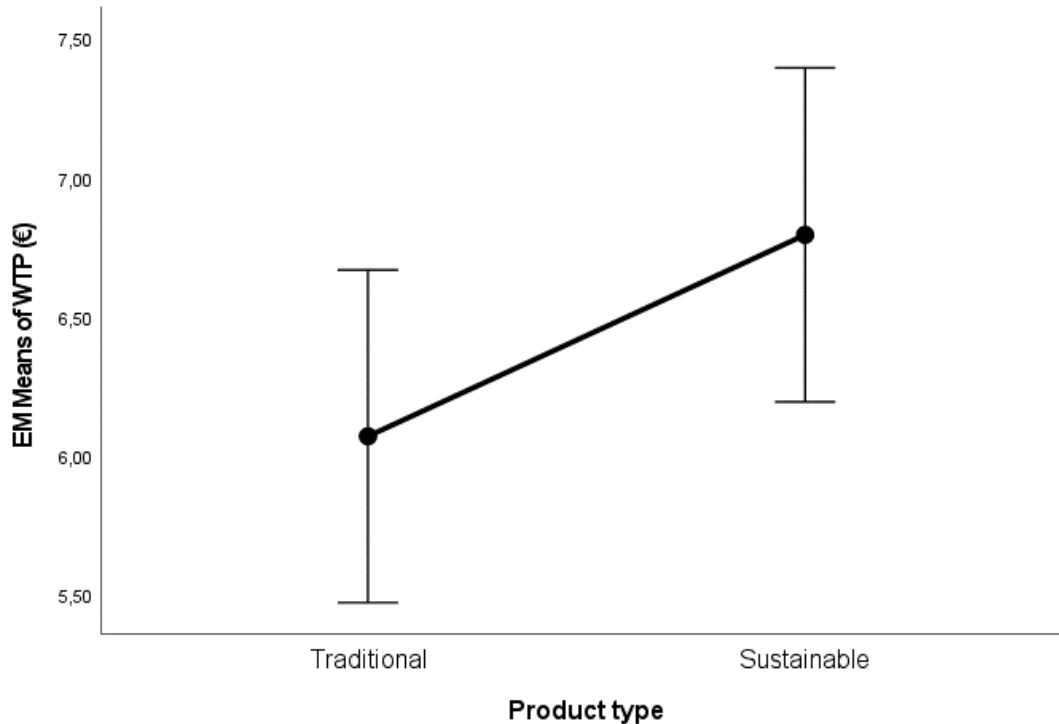
6.2 Hypothesis testing

6.2.1 Willingness-to-Pay as outcome

6.2.1.1 Direct effect of sustainable (vs traditional) laundry detergent on consumers' WTP

In the main effect conditions, 126 participants were exposed to the sustainable laundry detergent ($M = 6.793$, $SD = 3.561$), and 127 participants were exposed to the traditional laundry detergent ($M = 6.069$, $SD = 2.653$). The following line chart visualizes the effect sizes:

Direct effect on WTP (€): Product type



According to the line chart, consumers have a higher estimated marginal mean WTP (€) toward the sustainable product. However, the error bars overlap (95% CI), which may indicate that the groups are not statistically different. Nevertheless, overlapping error bars do not necessarily imply that there are no significant differences between groups, as it is simply a rule of thumb for approximating the p values (Payton, Greenstone, & Schenker, [2003](#); Lanzante, [2005](#); Cumming, Fidler, & Vaux, [2007](#)). The following hypothesis is tested:

H_{1a} : Sustainable (vs traditional) products has a positive effect on the consumers' WTP ($\beta_1 > 0$).

H_{1a} will be tested using simple linear regression. The following model is tested: $Y_{WTP} = \beta_0 + \beta_1 X_{Product\ type} + \varepsilon$, where product type is a dichotomous variable where 1 = sustainable laundry detergent, 0 = traditional laundry detergent. The following table represents the coefficient table:

Coefficient table

Variable	Unstandardized coefficients		Standardized coefficients	<i>t</i>	<i>p</i>
	<i>B</i>	<i>SE</i>	β		
Constant	6.069	.304		19.991	<.001
Product type ^a	.724	.430	.106	1.683	.094

^aProduct type = 1 if sustainable, 0 if traditional.

The linear regression was statistically significant at the 95% level, $B_1 = .724$, $t(251) = 1.683$, $p = 0.094/2 = .047$. Thus, H_0 is rejected; the sustainable (vs traditional) laundry detergent has a positive effect on the consumers' WTP. More specifically, while holding everything else constant, consumers are willing to pay € 0.724 more for the sustainable laundry detergent compared to the WTP for the traditional laundry detergent ($\beta_0 = € 6.069$), yielding a green price premium of: $\frac{\text{Product price (\$)} - \text{Benchmark price (\$)}}{\text{Benchmark price (\$)}} \times 100\% =$

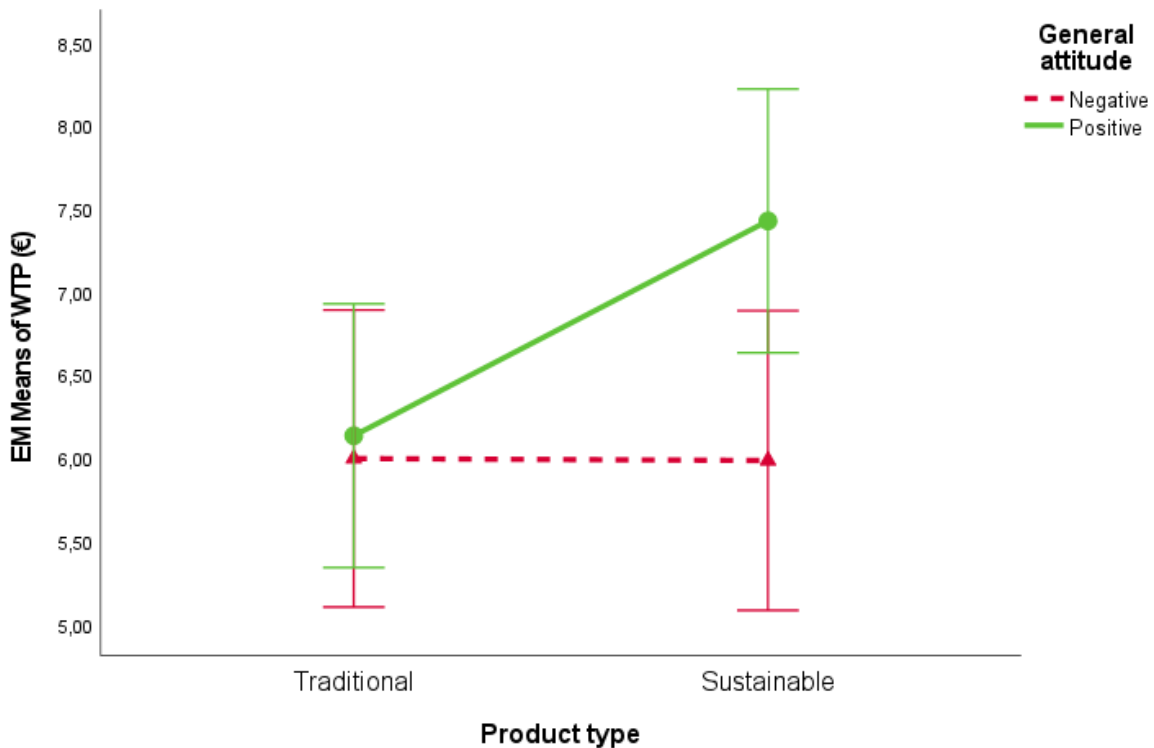
$$\frac{(\Sigma b_i) - b_0}{b_0} \times 100\% = \frac{(6.069 + 0.724) - 6.069}{6.069} \times 100\% = 11.93\%.$$

The computation of price premium is based on the definition that was discussed in the literature review. As b_0 represents the mean WTP (€) of the reference group, i.e., the benchmark, and b_1 represents the additional change in WTP (€) with respect to the sustainable product, summing the coefficients represents the WTP the consumers are willing to pay for the sustainable product type, i.e., the price of the sustainable product.

6.2.1.2 Interaction effect on WTP: General attitudes × Sustainable (vs traditional) laundry detergent

In the interaction effect conditions with respect to general attitudes, 71 participants were exposed to the sustainable laundry detergent, combined with having a positive general attitude towards sustainability ($M = 7.422$, $SD = 4.038$). Furthermore, a total of 55 participants were exposed to the sustainable laundry detergent, combined with having a negative general attitude toward sustainability ($M = 5.980$, $SD = 2.653$). Moreover, 71 participants were exposed to the traditional laundry detergent, combined with having a positive general attitude toward sustainability ($M = 6.129$, $SD = 3.085$). Lastly, 56 participants were exposed to the traditional laundry detergent, combined with having a negative general attitude toward sustainability ($M = 5.992$, $SD = 3.529$). The following interaction plot visualizes the effect sizes:

EM Means of WTP (€): General attitude × Product type



According to the interaction plot (95% CI), there do not seem to be any significant interaction effects. However, considering that the sample sizes are not equal, the error margins can be misleading to interpret. On the other hand, we can read from the interaction plot that the participants with a positive general attitude that was exposed to the sustainable product type had a much higher EM mean WTP (€) compared to the same consumers that were exposed to the traditional product, suggesting that we have an interaction between the two variables. In fact, consumers in the sustainable product condition with positive general attitudes had the largest mean of all the groups. The following hypothesis is tested:

H_{2a}: Consumers' WTP for sustainable products (vs traditional) increases when having positive (vs negative), *general* attitudes toward sustainability ($\beta_3 > 0$).

H_{2a} will be tested using multiple linear regression with an interaction term. The following model is tested: $Y_{WTP} = \beta_0 + \beta_1 X_{Product\ type} + \beta_2 Z_{General\ attitude} + \beta_3 X_{Product\ type} Z_{General\ attitude} + \varepsilon$, where product type is a dichotomous variable where 1 = sustainable laundry detergent, 0 = traditional, and general attitude is also a dichotomous variable where 1 = positive general attitude, 0 = negative general attitude. The following table represents the coefficient table:

Coefficient table

Variable	Unstandardized coefficients		Standardized coefficients		<i>t</i>	<i>p</i>
	<i>B</i>	<i>SE</i>	β			
Constant	5.992	.454			13.202	<.001
Product type ^a	-.012	.645	-.002		-.019	.985
General attitude ^b	.137	.607	.020		-.226	.821
Product type ^a × General attitude ^b	1.305	.861	.171		1.516	.131

^aProduct type = 1 if sustainable, 0 if traditional.

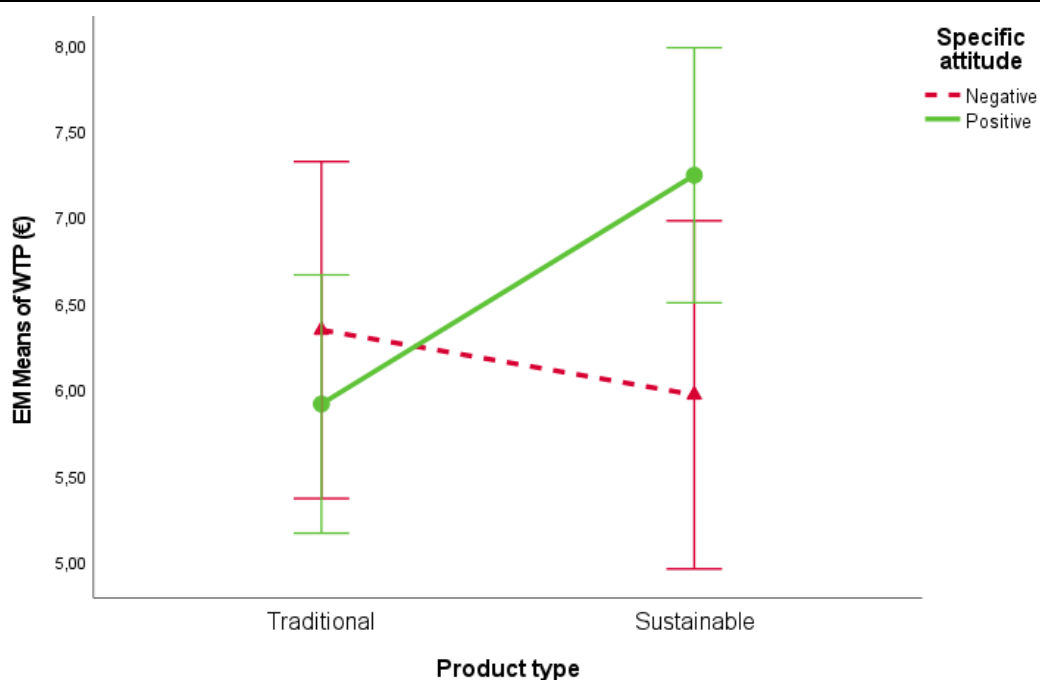
^bGeneral attitude = 1 if positive, 0 if negative.

The interaction term was statistically insignificant at the 95% level, $B_3 = 1.305$, $t(251) = 1.516$, $p = .131/2 = .0655$. The hypothesis test failed to reject H_0 , the consumers' WTP for sustainable (vs traditional) products does not depend on having positive (vs negative) general attitudes towards sustainability. Worth noting, however, is that the interaction effect is in fact significant at the 90% level, with an effect size of € 1.305 (cet. par.).

6.2.1.3 Interaction effect on WTP: Specific attitudes × Sustainable (vs traditional) laundry detergent

In the interaction effect conditions with respect to *specific* attitudes, 82 participants were exposed to the sustainable laundry detergent, combined with having a positive specific attitude towards sustainability ($M = 7.238$, $SD = 3.880$). Furthermore, a total of 44 participants were exposed to the sustainable laundry detergent, combined with having a negative specific attitude towards sustainability ($M = 5.963$, $SD = 2.740$). Moreover, 80 participants were exposed to the traditional laundry detergent, combined with having a positive specific attitude toward sustainability ($M = 5.910$, $SD = 3.030$). Lastly, 47 participants were exposed to the traditional laundry detergent, combined with having a negative specific attitude towards sustainability ($M = 6.339$, $SD = 3.674$). The following interaction plot visualizes the effect sizes:

EM Means of WTP (€): Specific attitude × Product type



According to the error bars (95% CI), there do not seem to be any significant interaction effects, however, considering that the sample sizes are unequal, the error margins can be misleading to interpret. Furthermore, the slopes are considerably unequal and illustrates a crossover effect which is a strong indication of an interaction. Moreover, the EM mean WTP (€) of the participants with a positive, specific attitude increases when they are exposed to the sustainable laundry detergent (compared to traditional) and have the highest EM mean of all groups. The following hypothesis is tested:

H_{3a}: Consumers' WTP for sustainable products (vs traditional) increases when having positive (vs negative), *specific* attitudes toward sustainability ($\beta_3 > 0$).

H_{3a} will be tested using multiple linear regression with an interaction term. The following model is built: $Y_{WTP} = \beta_0 + \beta_1 X_{Product\ type} + \beta_2 Z_{specific\ attitude} + \beta_3 X_{Product\ type} Z_{specific\ attitude} + \varepsilon$, where product type is a dichotomous variable where 1 = sustainable laundry detergent, 0 = traditional, and specific attitude is also a dichotomous variable where 1 = positive specific attitude, 0 = negative specific attitude. The following table represents the coefficient table:

Coefficient table

Variable	Unstandardized coefficients		Standardized coefficients	<i>t</i>	<i>p</i>
	<i>B</i>	<i>SE</i>	β		
Constant	6.339	.497		12.767	<.001
Product type ^a	-.376	.714	-.055	-.575	.599
Specific attitude ^b	-.430	.626	-.060	-.687	.493
Product type ^a × Specific attitude ^b	1.704	.892	.233	1.910	.057

^aProduct type = 1 if sustainable, 0 if traditional.

^bSpecific attitude = 1 if positive, 0 if negative.

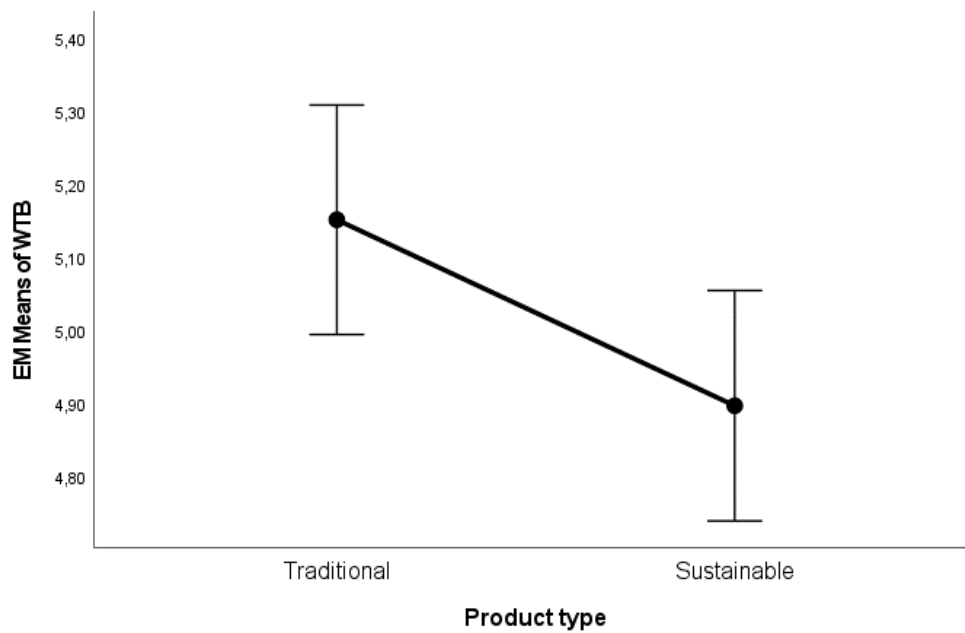
The interaction term is statistically significant at the 95% level, $B_3 = 1.704$, $t(251) = 1.910$, $p = .057/2 = .0285$. H_0 is rejected, the consumers' WTP for sustainable (vs traditional) products is positively moderated by having positive (vs negative) attitudes towards sustainability (cet. par.). More specifically, while holding everything else constant, consumers with positive, specific attitudes are willing to pay € 0.9 more for the sustainable laundry detergent compared to what those with negative specific attitudes are willing to pay for the traditional laundry detergent ($B_0 = € 6.339$), yielding a green price premium of: $\frac{(\sum b_i) - b_0}{b_0} \times 100\% = \frac{(6.339 + (-0.376) + (-0.430) + 1.704) - 6.339}{6.339} \times 100\% = 14.17\%$.

6.2.2 Willingness-to-Buy as outcome

6.2.2.1 Direct effect of sustainable (vs traditional) laundry detergent on consumers' WTB

In the main effect conditions, 126 participants were exposed to the sustainable laundry detergent ($M = 4.897$, $SD = 0.856$), and 127 participants were exposed to the traditional laundry detergent ($M = 5.151$, $SD = 0.937$). The following line chart visualizes the effect sizes:

Main effect on WTB: Product type



According to the line chart, the error bars (95% CI) overlap, implying that there is not significant difference, however, must be tested statistically to be certain. Furthermore, the participants have a higher EM mean WTB for the traditional product type, which ultimately imply that there might be an insignificant positive effect, and that we might see a significant negative effect. Nevertheless, the following hypothesis is tested:

H_{1b}: Sustainable (vs traditional) laundry detergents has a positive effect on the consumers' WTB ($\beta_1 > 0$).

H_{1b} will be tested using simple linear regression. The following model is tested: $Y_{WTB} = \beta_0 + \beta_1 X_{Product\ type} + \varepsilon$, with product type as a dichotomous variable where 1 = sustainable laundry detergent, 0 = traditional laundry detergent. The following table represents the coefficient table:

Coefficient table

Variable	Unstandardized coefficients		Standardized coefficients	<i>t</i>	<i>p</i>
	<i>B</i>	<i>SE</i>			
Constant	5.151	.080		64.653	<.001
Product type ^a	-.254	.113	-.141	-2.253	.025

^aProduct type = 1 if sustainable, 0 if traditional.

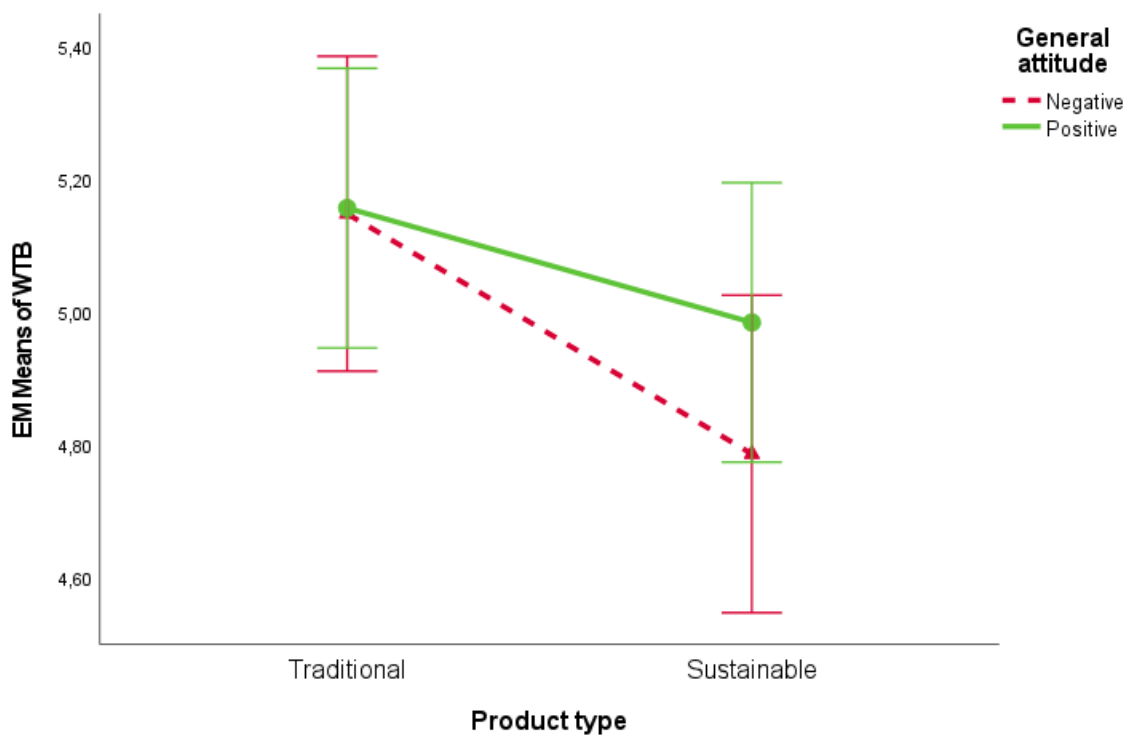
As suspected, the test yielded a statistically significant negative effect at the 95% level, $B_1 = -.254$, $t(251) = -2.253$, $p = .025/2 = .0125$, meaning that when holding everything else constant, the sustainable (vs traditional) laundry detergent has an negative effect on the consumers' WTB. More specifically, consumers in general are $\frac{(\sum b_i) - b_0}{b_0} \times 100\% = \frac{(5.151 + (-0.254)) - 5.151}{5.151} \times 100\% = 4.93\%$ less likely to purchase the sustainable laundry detergent (cet. par.).

Ultimately, with respect to H_{1b} , there was no statistically significant positive effect, $p = 1 - 0.0125 = .9875$, as it stated that sustainable (vs traditional) laundry detergents had a *positive* effect on the consumers WTB sustainable products.

6.2.2.2 Interaction effect on WTB: General attitudes × Sustainable (vs traditional) laundry detergent

In the interaction effect conditions with respect to *general* attitudes, 71 participants were exposed to the sustainable laundry detergent, combined with having a positive *general* attitude towards sustainability ($M = 4.983$, $SD = 0.885$). Furthermore, 55 participants were exposed to the sustainable laundry detergent, combined with having a negative *general* attitude towards sustainability ($M = 4.786$, $SD = 0.813$). Moreover, 71 participants were exposed to the traditional laundry detergent, combined with having a positive *general* attitude toward sustainability ($M = 5.155$, $SD = 0.867$). Lastly, 56 participants were exposed to the traditional laundry detergent, combined with having a negative *general* attitude toward sustainability ($M = 5.146$, $SD = 1.028$). The following interaction plot visualizes the effect sizes:

EM Means of WTB: General attitudes × Product type



According to the interaction plot, the consumers seem to have a smaller EM mean WTB towards the sustainable product when having a positive attitude towards sustainability, compared to its reference group, the EM mean WTB of traditional products, when having negative attitudes toward sustainability. Additionally, the slopes seem to be approximately equal, in addition to overlapping error bars (95% CI). Thus, the hypothesis is therefore likely to be non-significant. Nevertheless, the following hypothesis is tested:

H_{2b}: Consumers' WTB for sustainable products (vs traditional) increases when having positive (vs negative), *general* attitudes toward sustainability ($\beta_3 > 0$).

H_{2b} will be tested using multiple linear regression with an interaction term. The following model is tested: $Y_{WTB} = \beta_0 + \beta_1 X_{Product\ type} + \beta_2 Z_{General\ attitude} + \beta_3 X_{Product\ type} Z_{General\ attitude} + \varepsilon$, where product type is a dichotomous variable where 1 = sustainable laundry detergent, 0 = traditional, and general attitude is also a dichotomous variable where 1 = positive general attitude, 0 = negative general attitude.

Coefficient table

Variable	Unstandardized coefficients		Standardized coefficients		
	<i>B</i>	<i>SE</i>	β	<i>t</i>	<i>p</i>
Constant	5.146	.120		42.850	<.001
Product type ^a	-.361	.171	-.200	-2.116	.035
General attitude ^b	.009	.161	.005	.053	.958
Product type ^a × General attitude ^b	.189	.228	.094	.831	.407

^aProduct type = 1 if sustainable, 0 if traditional.

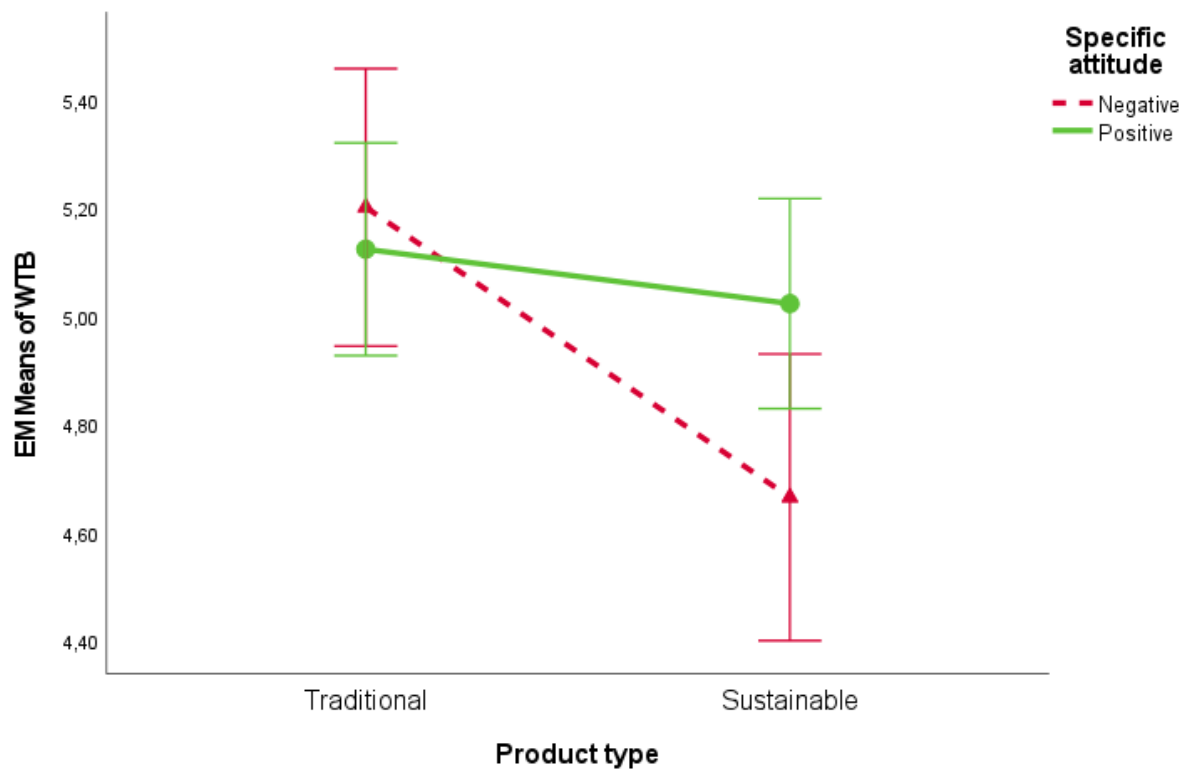
^bGeneral attitude = 1 if positive, 0 if negative.

The interaction term was statistically insignificant at the 95% level, $B_3 = .189$, $t(251) = .831$, $p = .407/2 = .204$. The hypothesis test failed to reject H₀, the consumers' WTB for sustainable (vs traditional) products does not depend on having positive (vs negative) general attitudes towards sustainability.

6.2.2.3 Interaction effect on WTB: Specific attitudes × Sustainable (vs traditional) laundry detergent

In the interaction effect conditions with respect to *specific* attitudes, 82 participants were exposed to the sustainable laundry detergent, combined with having a positive *specific* attitude towards sustainability ($M = 5.022$, $SD = 0.833$). Furthermore, 44 participants were exposed to the sustainable laundry detergent, combined with having a negative *specific* attitude towards sustainability ($M = 4.664$, $SD = 0.860$). Moreover, 80 participants were exposed to the traditional laundry detergent, combined with having a positive *specific* attitude toward sustainability ($M = 5.123$, $SD = 0.993$). Lastly, 47 participants were exposed to the traditional laundry detergent, combined with having a negative *specific* attitude towards sustainability ($M = 5.200$, $SD = 0.842$). The following interaction plot visualizes the effect sizes:

EM Means of WTB: Specific attitude × Product type



According to the interaction plot, the slopes are unequal and illustrates a crossover effect, which is a strong indication of an interaction. Moreover, the EM mean WTB of the participants with a positive, specific attitude towards sustainability has a lower EM mean WTB toward the sustainable product than its reference category; consumers with a negative attitude exposed to the traditional product, however, the reference category has a considerable drop in WTB when exposed to the sustainable product. The following hypothesis is tested:

H_{3b}: Consumers' WTB for sustainable products (vs traditional) increases when having positive (vs negative), *specific* attitudes towards sustainability ($\beta_3 > 0$).

H_{3b} will be tested using multiple linear regression with an interaction term. The following model is built: $Y_{WTB} = \beta_0 + \beta_1 X_{Product\ type} + \beta_2 Z_{specific\ attitude} + \beta_3 X_{Product\ type} Z_{specific\ attitude} + \varepsilon$, where product type is a dichotomous variable where 1 = sustainable laundry detergent, 0 = traditional, and specific attitude is also a dichotomous variable where 1 = positive specific attitude, 0 = negative specific attitude. The following table represents the coefficient table:

Coefficient table

Variable	Unstandardized coefficients		Standardized coefficients		
	<i>B</i>	<i>SE</i>	β	<i>t</i>	<i>p</i>
Constant	5.200	.130		39.927	<.001
Product type ^a	-.536	.187	-.297	-2.864	.005
Specific attitude ^b	-.077	.164	-0.041	-.472	.637
Product type ^a × Specific attitude ^b	.436	.234	.226	1.862	.064

^aProduct type = 1 if sustainable, 0 if traditional.

^bSpecific attitude = 1 if positive, 0 if negative.

The interaction term is statistically significant at the 95% level, $B_3 = .436$, $t(251) = 1.862$, $p = .064/2 = .032$. H_0 is rejected; having *positive* (vs negative) specific attitudes towards sustainability positively moderates the consumers' WTB sustainable (vs traditional) products (cet. par.). However, even though it has a positive effect on the consumers' WTB, the green WTB premium is still negative. More specifically, holding everything else constant, consumers with positive, specific attitudes have a 0.178 lower WTB toward the sustainable laundry detergent compared to what the consumers with a negative specific attitude have toward the traditional laundry detergent ($B_0 = 5.2$), yielding a negative green WTB premium of $\frac{(\sum b_i) - b_0}{b_0} \times 100\% = \frac{(5.200 + (-0.536) + (-0.077) + 0.436) - 5.200}{5.200} \times 100\% = -3.40\%$. The negative WTB premium reduced from -4.93% to -3.40%. Worth noting is that even though it is still negative, the negative premium is marginal.

7. Discussion

Three out of six hypotheses were significant at the 95% level. The overall findings suggest that the consumers' WTP and WTB for sustainable products depend on their *specific* attitudes towards sustainability and not their *general* attitudes, which supports the assumption and critique of research on attitudes that the findings depend on the level of specificity between the measurement (scales) and the attitudinal object, in this case, using a sustainable laundry detergent.

The direct effect of H_{1a} was significant, implying that consumers, in general, are willing to pay more for sustainable laundry detergents compared to traditional, less sustainable versions. More specifically, consumers were willing to pay an 11.93% price premium for the sustainable version, meaning that, in general, managers can price sustainable products within this category higher without risking overpricing their products and thus experience a decrease in unit sales. According to the literature review, sustainable products are more expensive to produce, meaning that managers can, in fact, price their products higher and thereby obtain the same, or even a higher profit margin, depending on their costs.

Moreover, H_{2a}, which aimed to investigate whether general attitudes moderated the consumers' WTP for sustainable products, was statistically insignificant at the 95% level, which is not surprising, as prior research on the moderating role of attitudes on intentions and behavior towards sustainable products have been inconsistent and have for the most part measured attitudes on a general level. Worth noting, however, is that the interaction effect was significant at the 90% level, in a positive direction ($B_3 = 1.305$). On the other hand, H_{3a} was statistically significant at the 95% level, which supports the latter argument that we need consistency in the level of specificity between the measured attitude and the attitudinal object (i.e., using a sustainable laundry detergent). More specifically, consumers that had positive *specific* attitudes towards sustainability were willing to pay 14.17% more for the sustainable laundry detergent, compared to what the consumers with negative specific attitudes were willing to pay for the less sustainable alternative. Considering that the interaction effect of specific attitudes was significant at the 95% level (vs 90% for general attitudes), and that the effect size was larger, I conclude with respect to the research question that specific attitudes to a larger extent are better at predicting WTP.

With WTB as the dependent variable, H_{1b} was, on the other hand, statistically insignificant at the 95% level; the consumers were not more likely to buy the sustainable version. However, there was, in fact, a statistically significant negative effect, meaning that the consumers, seen as a whole, were 4.93% less likely to purchase the sustainable laundry detergent. This contradicts the findings of Luchs et al. (2010), which found that consumers had a stronger preference and more positive intentions toward sustainable products that belong to categories that are associated with gentleness-related attributes, such as laundry detergents. H_{2b}, which aimed to test whether general attitudes moderated the consumers' WTB sustainable products, was statistically insignificant at the 95% level. However, H_{3b} was, in fact, statistically significant at the

95% level, meaning that having positive *specific* attitudes positively moderates the consumers' WTP for sustainable products. Nevertheless, even though it positively moderated this segment's WTP, the WTB premium was still negative. More specifically, consumers with *positive* specific attitudes towards sustainability had a 3.40% *lower* WTB for the sustainable version compared to the WTB consumers with a negative attitude had for the traditional version. Worth mentioning, however, is that the negative WTB premium was marginal.

To summarize the key findings, H_{1a} documented that consumers, in general, were willing to pay significantly more for the sustainable laundry detergent (11.93%). Additionally, building on the latter finding, H_{3a} was significant and showed that when consumers have positive specific attitudes towards sustainability, it positively moderated their WTP for sustainable products, increasing the green price premium to 14.17%. Moreover, H_{1b} proved that consumers, in general, were less likely to purchase the product (-4.93%). However, when the consumers had positive specific attitudes towards sustainability, it positively moderated their WTB. The WTB premium was still negative yet marginal (-3.40%), therefore having a small impact on the consumers' WTB. Given the relatively big increase in WTP, it is reasonable to assume that sustainable products, when marketed directly towards this segment, marketing managers have a significant market opportunity in terms of obtaining higher profit margins and increased unit sales, assuming that there is no intention-action gap.

8. Limitations and future research

8.1 Inconsistency in the *specific attitude* measurement scales

In retrospect, the scales that were used to operationalize specific attitudes in the thesis could have been even more specific, as the factor analysis was highly inconsistent in terms of being poorly correlated, in addition to a poor Chronbach's alpha, ultimately meaning that the validity and reliability of the findings are low. This also supports the overall discussion and gives more weight to the argument that human behavior is complex, inconsistent, and hard to predict. Managers and scholars that wish to perform market research need to be very careful when operationalizing attitudes to avoid uncorrelated scales that are supposed to represent the same attitudinal dimension (i.e., the attitudinal domain). If a consumer states that he or she has a positive attitude towards sustainability in general, the attitude might not be positive if we zoom in on specific areas within the attitudinal domain, such as using environmentally friendly products in our homes or purchasing environmentally friendly food.

This limitation could have been avoided if the pilot study had a bigger sample; however, due to time limitations, I had to proceed with the main study. This involved using the findings of the pilot study in combination with my own intuition to adjust the main study.

Future research should aim to achieve a proper sample size for the pilot study aimed at securing more specificity in the scales so it is more tightly connected to the attitudinal domain in order to yield more consistency in the measurement scales. The more measures that can be merged into one dimension, the more precise it becomes as it reduces random error (Robinson, [2021](#)).

8.2 Differences across product categories

Another limitation to the study is that I was unfortunately not able to conduct the food experiment, which could have made it possible to see whether there are any differences across different product categories. However, considering that the literature review found food and laundry detergents (in addition to the thesis) to have a green price premium, it is more likely that these two categories would have yielded similar results. Testing with other categories, such as cars, energy, internet services, and banking, among others, is of interest for future research, as it is likely that the consumers' preferences, behavior, and intentions differ across product categories. For instance, Luchs et al. ([2010](#)) documented that consumers preferred traditional alternatives when the product category was associated with strength-related attributes, such as hand sanitizers and car tires. Ultimately, the findings of the thesis are not likely to be generalizable across different product categories. Future research should investigate more product categories and aim to find common grounds that can be applicable across categories, making it easier to identify price and WTB premiums for sustainable products.

8.3 Generation Z's WTB and WTP for sustainable products

Future research should investigate age differences with respect to WTB and WTP. More specifically, the literature review revealed that younger generations are more concerned with issues related to sustainability, and therefore, I hypothesize that younger consumers, depending on the product category, are more likely to purchase sustainable products. Additionally, it would be interesting to investigate younger segments' WTP and the price premiums they would be willing to pay for sustainable products. Considering that younger generations have less purchasing power due to not being as financially stable as older consumers, I hypothesize that younger generations are likely to not be willing to pay price premiums, regardless of having a higher WTB. Research that investigates and aims to identify factors that could positively affect their WTP is of interest, as younger segments will become increasingly more important over time as they age and become the "grown-up" segment. According to the literature review, consumption play a significant part of the overall climate footprint in addition to social issues. Thus, given that younger segments are more concerned with sustainability, thereby having more positive attitudes towards sustainability, research on the topic is valuable as it could potentially have a significant impact on sustainable development.

8.4 Geographical and cultural differences

Environmental concerns, and concerns about sustainability, are highly fragmented across the world (World Population Review, [2022](#)), as it likely depends on several factors, such as the consumers' purchasing power and their respective countries' economy, cultures, and welfare levels. Thus, it is not likely that the finding in the study is generalizable across continents. Ultimately, a cross-cultural study investigating the consumers' WTB and WTP is of interest, as it would map out how price and WTB premiums differ across the world. For instance, in Africa, it is not reasonable to expect that consumers, in general, are willing to pay price premiums for sustainable products, regardless of having positive attitudes towards sustainability, as the general welfare level is low, and more elementary needs are needed to be fulfilled before being able to prioritize sustainable development. I hypothesize that consumers in countries with a lower standard of living have smaller levels of WTB and WTP and that these variables are not moderated by their attitudes towards sustainability.

8.5 Investigating the mechanisms with real purchasing data

Finally, investigating the mechanisms that were pursued by the thesis with real purchasing data, following the consumers' WTP and WTB, for instance through a field experiment, is of high interest. As discussed in the literature review, the intention-action gap is highly present when investigating sustainable consumption. According to Moser ([2015](#)), WTP is a strong antecedent for purchasing sustainable products. Investigating how *specific* attitudes affect the consumers' purchasing behavior through WTP and WTB as antecedents would be interesting, as we would observe how it affects the intention-action gap. Without real purchasing data, it is not possible to conclude whether WTP, is in fact, able to reduce the intention-action gap.

8.6 Investigating WTP using a reference price

According to Bolton et al. (2003), reference prices are important to consumers in their evaluations of prices and their perceptions of price fairness. The experiment in the thesis did not provide the participants with a reference price, which is likely to have induced more variance in the dependent variable (WTP). Including a reference price could potentially reduce the variance, yielding more precise estimates with smaller confidence intervals. However, providing a reference price could increase the possibility of biased estimates as it could be leading, as some consumers lack price knowledge in various product categories. It would be possible to investigate the consumers' WTP both with and without a reference price, depending on the survey flow of the questionnaire. Ultimately, reference prices represent an interesting idea for future research.

8.7 Investigating WTB and WTP through various levels of sustainability

The last limitation of the study is that it is limited to only one level of sustainability with respect to the manipulations that were created for the experiment. Thus, future research should investigate how different levels of sustainability affect the consumers' WTB and WTP. From a global and development perspective, products should be as sustainable as possible, however, the more sustainable the product or business practices are, the more expensive are they likely to become, ultimately decreasing the overall profitability and consequently the attractiveness of the products from a commercial perspective. Thus, an interesting question is how much sustainability is needed to generate an effect in the outcome variables.

9. Contributions and managerial relevance

Answering the research question contributes to the stream of marketing research in (green) consumer behavior, more specifically, how we can use marketing to make business more sustainable by investigating the antecedents and the process leading up to sustainable consumption. Additionally, the thesis has shown how important it is to operationalize attitudes on a specific level, achieving consistency between the measured attitude and the attitudinal object. In fact, the consumers' general attitudes did not predict the consumers' WTP and WTB, which ultimately emphasizes the importance of the finding.

Not only is the research in the interest of scholars and policymakers but also managers since it provides a deeper understanding of the mechanisms that lead to purchase, more specifically, the consumers' WTP (and WTP premiums) and WTB, ultimately reducing the risk of sustainable products becoming market failures. The intention-action gap between the consumers' increasingly positive attitudes and preferences towards sustainable products and their purchasing behavior is arguably one of the biggest issues within the field of green consumer behavior, and this research contributes to a deeper understanding of the issue. For instance, the attitude-behavior gap was still present in the findings if we assume WTB to be the true estimator of purchasing behavior. However, the WTB was marginally negative, while the green WTP premium was considerably large for consumers with a positive specific attitude towards sustainability, meaning that there is a market opportunity for managers that wish to sell sustainable products.

More specifically, the price premium that the segment consisting of consumers with positive *specific* attitudes towards sustainability was willing to pay a 14.17% green price premium (an increase from 11.93% when ignoring attitudes), relative to what consumers with *negative* specific attitudes towards sustainability were willing to pay for the traditional version. However, consumers, in general, had a negative yet marginal WTB premium in relation to the sustainable product (-4.93%). The effect was, on the other hand, positively moderated by having positive specific attitudes, increasing the consumers' WTB by 1.53% to -3.40%. Consumers are still less willing to buy the sustainable product; however, the negative premium is marginal and, therefore, not likely to have a large impact on profitability, as the WTP premium is considerably large. The following table summarizes the premiums obtained in the study:

Premiums

Effects on Willingness-to-Pay	WTP premium %	Δ%
Direct effect of sustainable (vs traditional) product type on WTP:	11.93%	
Moderated effect of positive (vs negative) attitudes on the effect of sustainable (vs traditional) product type on WTP:	14.17%	2.24%
Effects on Willingness-to-Buy	WTB premium %	
Direct effect of sustainable (vs traditional) product type on WTB:	-4.93%	
Moderated effect of positive (vs negative) attitudes on the effect of sustainable (vs traditional) product type on WTB:	-3.40%	1.53%

10. Conclusion

The aim of the thesis was to investigate the following research question:

“How do consumers’ general and specific attitudes towards sustainability affect their Willingness-to-Pay and Willingness-to-Buy sustainable products? And, are specific attitudes better at predicting the outcomes?”

In conclusion, the thesis found that consumers with positive, specific attitudes toward sustainability had a significantly larger WTP for sustainable products compared to what those with a negative, specific attitude were willing to pay for traditional products. More specifically, the findings are in support of the overall thesis, as we need a corresponding level of specificity between the attitude we measure, and the attitude object, in order to consistently predict an outcome, as only specific attitudes were able to consistently and significantly predict the outcomes at the 95% level. Furthermore, the thesis provides evidence of specific price premiums that segments with positive attitudes towards sustainability are willing to pay for sustainable products. Sustainable products are more expensive to produce, which can make these products unattractive to produce and offer due to insecurity in the pricing strategies, as selecting an inadequate price can, in the worst case, result in lower profitability, depending on the segment’s price elasticity. With a higher WTP, the price elasticity of the segment is lower and more inelastic, meaning that managers can, in fact, price sustainable laundry detergents higher without decreasing unit sales and ultimately weaken the overall profitability, depending on their costs.

Moreover, the same segment had a marginally lower WTB for the sustainable product compared to the opposing segment; consumers with negative attitudes’ and their WTB for the traditional product. Considering that the negative WTB was considerably low (-3.40%) compared to the segment’s WTP premium (14.17%), I argue that the profitability will still be higher if targeting sustainable products toward this segment.

The biggest limitation of the thesis is that the experiment failed to operationalize the specific attitude dimension, ultimately achieving poor levels of validity and reliability in a focal variable. Thus, it is hard to argue that the findings are generalizable and representative of the population. Nevertheless, this limitation gives clear evidence of how attitudes, in fact, should be measured in order to secure more consistency in the findings when investigating the role of attitudes in the scope of sustainable consumption, which has a major impact on sustainable development.

The thesis contributes to the stream of marketing research on green consumer behavior by addressing a largely overseen aspect of measuring attitudes. Attitudes do, in fact, have significant prediction capabilities of intentions, and future research on the topic should be careful when operationalizing attitudes, so it reaches consistency in the specificity between the attitude and the attitudinal object. Additionally, investigating WTP as a dependent variable in relation to intentions is a novel approach that yielded specific price premiums across important consumer segments. To achieve sustainable development, it is impossible to ignore consumer behavior, as it largely impacts the SDGs. Only by addressing the issue are we able to make a difference.

11. Bibliography

- Aaker, D. A. (1996). Measuring Brand Equity across Products and Markets. *California Management Review*, Vol. 38, pp. 102 – 120. <http://dx.doi.org/10.2307/41165845>
- A Greener World. (2022). *Certified Animal Welfare Approved by A Greener World*. A Greener World. <https://agreenerworld.org.za/certifications/animal-welfare-approved/>
- Ajzen, I., & Fishbein, M. (1977). Attitude-Behavior Relations: A Theoretical Analysis and Review of Empirical Research. *Psychological Bulletin*, Vol. 84(5), pp. 888 – 918. <https://doi.org/10.1037/0033-2909.84.5.888>
- Ajzen, I., & Fishbein, M. (2005). The influence of attitudes on behavior. In Albarracín, D., Johnson, B. T., & Zanna, M. P. (Eds.). *The handbook of attitudes* (pp. 173 – 221). Lawrence Erlbaum Associates Publishers. https://www.researchgate.net/publication/264000974_The_Influence_of_Attitudes_on_Behavior
- American Psychological Association (2022a). *Attitude*. APA Dictionary of Psychology. <https://dictionary.apa.org/attitude>
- American Psychological Association (2022b). *Attitude object*. APA Dictionary of Psychology. <https://dictionary.apa.org/attitude-object>
- American Psychological Association (2022c). *Self-report bias*. APA Dictionary of Psychology. <https://dictionary.apa.org/self-report-bias>
- Anselmsson, J., Bondesson, N., & Johansson, U. (2014). Brand image and customers' willingness to pay a price premium for food brands. *Journal of Product & Brand Management*, Vol. 23(2), pp. 90 – 102. <https://doi.org/10.1108/JPBM-10-2013-0414>
- Anselmsson, J., Johansson, U., & Persson, N. (2007). Understanding price premium for grocery products: a conceptual model of customer-based brand equity. *Journal of Product & Brand Management*, Vol. 16(6), pp. 401 – 414. <https://doi.org/10.1108/10610420710823762>
- Ballard, C. (2019). *An Ode To R-Squared*. Towards Data Science. <https://towardsdatascience.com/an-ode-to-r-squared-804d8d0ed22c>
- Bendle, N. T., Farris, P. W., Pfeifer, P. E., & Reibstein, D. J. (2015). *Marketing Metrics, The Manager's Guide to Measuring Marketing Performance* (3rd ed.). Pearson Education.
- Bolton, L. E., Warlop, L., & Alba, J. W. (2003). Consumer Perceptions of Price Un(fairness). *Journal of Consumer Research*, Vol. 29(4), pp. 474 – 491. <https://doi.org/10.1086/346244>

- Bray, J., Johns, N., & Kilburn, D. (2011). An exploratory study into the factors impeding ethical consumption. *Journal of Business Ethics*, Vol. 98(4), pp. 597 – 608. <https://doi.org/10.1007/s10551-010-0640-9>
- Business Wire (2021, October 14). Recent Study Reveals More Than a Third of Global Consumers Are Willing to Pay More for Sustainability as Demand Grows for Environmentally-Friendly Alternatives. *Newspaper, Business Wire*. <https://tinyurl.com/4x2f7zmz>
- Cole, C. (2007). In Birren, J. E. (Ed.). *Encyclopedia of Gerontology* (p. 307). Elsevier Science. https://books.google.it/books/about/Encyclopedia_of_Gerontology.html?id=XepGAAAAMAAJ&redir_esc=y
- Cumming, G., Fidler, F., & Vaux, D. L. (2007). Error bars in experimental biology. *Journal of Cell Biology*, Vol. 177(1), pp. 7 – 11. <https://doi.org/10.1083/jcb.200611141>
- Cyprus, J. (2020). *What Makes a Product Sustainable?* Earth911. <https://earth911.com/business-policy/what-makes-a-product-sustainable/>
- Deloitte (2021). *Shifting sands: Are consumers still embracing sustainability? Changes and key findings in sustainability and consumer behavior in 2021*. Deloitte. <https://www2.deloitte.com/uk/en/pages/consumer-business/articles/sustainable-consumer.html>
- Dodds, W. B., Monroe, K. B., & Grewal, D. (1991). Effects of price, brand, and store information on buyers' product evaluations. *Journal of Marketing Research*, Vol. 28(3), pp. 307 – 319. <https://doi.org/10.2307/3172866>
- Donato, C., & D'Aniello, A. (2021). Tell me more and make me feel proud: the role of eco-labels and informational cues on consumers' food perceptions. *British Food Journal* (ahead-of-print). <https://doi.org/10.1108/BFJ-04-2021-0416>
- Engel, J. F., Blackwell, R. D., & Kollat, D. T. (1978). *Consumer behavior* (3rd ed.). Hinsdale, III. : Dryden Pr.
- European Commission (2022a). *Food waste*. European Commission. https://ec.europa.eu/food/safety/food-waste_en
- European Commission (2022b). *EU Ecolabel*. European Commission. <https://ec.europa.eu/environment/ecolabel/news.html>
- European Commission (2022c). *The organic logo*. European Commission. https://ec.europa.eu/info/food-farming-fisheries/farming/organic-farming/organic-logo_en

- Falk, R. F., & Miller, N. B. (1992). *A Primer for Soft Modeling*. The University of Akron Press: Akron, OH.
- Fernando, J., Boyle, M. J., & Beer, K. (2021). *Law of Supply and Demand*. Investopedia. <https://www.investopedia.com/terms/l/law-of-supply-demand.asp>
- Fernando, J., Brock, T., & Munichiello, K. (2022). *Corporate Social Responsibility*. Investopedia. <https://www.investopedia.com/terms/c/corp-social-responsibility.asp>
- Frost, J. (2022). *How High Does R-squared Need to Be?* Statistics By Jim. <https://statisticsbyjim.com/regression/how-high-r-squared/>
- Fishbein, M., & Ajzen, I. (1975). *Belief, Attitude, Intention, and Behavior: An Introduction to Theory and Research*. Reading, MA: Addison-Wesley.
- Frymier, A. B., & Nadler, M. K. (2017). *Persuasion: Integrating Theory, Research, and Practice* (4th ed.). Kendall Hunt Publishing. https://he.kendallhunt.com/sites/default/files/heupload/pdfs/Ch3_Frymier_4e.pdf
- Gallestegui, G. (2002). The use of eco-labels: a review of the literature. *European Environment, Vol. 12*(6), pp. 316 – 331. <https://doi.org/10.1002/eet.304>
- Gerhardt, C. (2022). *Why today's pricing is sabotaging sustainability*. Kearney. <https://www.nl.kearney.com/consumer-retail/article/?/a/why-todays-pricing-is-sabotaging-sustainability>
- Goldstein, B., Gounaridis, D., & Newell, J. P. (2020). The carbon footprint of household energy use in the United States. *Proceedings of the National Academy of Sciences of the United States of America (PNAS), Vol. 117*(32). <https://doi.org/10.1073/pnas.1922205117>
- Hayes, A., James, M., & Schmitt, K. R. (2022). *Perfect Competition*. Investopedia. <https://www.investopedia.com/terms/p/perfectcompetition.asp>
- Hill, R. (1998). What sample size is “enough” in internet survey research? *Interpersonal Computing and Technology: An Electronic Journal for the 21st Century, Vol. 6*(3 – 4). <https://docplayer.net/17982984-What-sample-size-is-enough-in-internet-survey-research.html>
- Hoewe, J. (2017). Manipulation Check. *The International Encyclopedia of Communication Research Methods*. <https://doi.org/10.1002/9781118901731.iecrm0135>
- Isaac, S., & Michael, W. B. (1995). *Handbook in research and evaluation*. San Diego, CA: Educational and Industrial Testing Services.

- Jacoby, J. (2001). In Smelser, N. J., & Baltes, P. B (Eds.). *Intentional Encyclopedia of the Social & Behavioral Sciences*. Elsevier. <https://www.elsevier.com/books/international-encyclopedia-of-social-and-behavioral-sciences/smelser/978-0-08-043076-8>
- Joshi, Y., & Rahman, Z. (2015). Factors Affecting Green Purchase Behavior and Future Research Directions. *International Strategic Management Review*, Vol. 3(1-2), pp. 128 – 143. <https://doi.org/10.1016/j.ism.2015.04.001>
- Kahnemann, D., Knetsch, J. L., & Thaler, R. (1986). Fairness as a Constraint on Profit Seeking: Entitlements in the Market. *The American Economic Review*, Vol. 76(4), pp. 728 – 741. <https://www.jstor.org/stable/1806070>
- Kenton, W., Boyle, M. J., & Kvilhaug, S. (2022). *Triple Bottom Line*. Investopedia. <https://www.investopedia.com/terms/t/triple-bottom-line.asp>
- Kostadinova, E. (2016). Sustainable Consumer Behavior: Literature Overview. *Economic Alternatives*, Issue 2, pp. 224 – 234. http://ips.bg/Uploads/Alternatives/Elena_9_ALTERNATIVI_br2_2016-en.pdf
- Krososky, A. (2021). *The Cost of Environmentalism: Why Sustainable Products Are More Expensive*. Greenmatters. <https://www.greenmatters.com/p/are-sustainable-products-more-expensive>
- Lancaster, G. A., Dodd, S., Williamson, P. R. (2004). Design and analysis of pilot studies: recommendations for good practice. *Journal of Evaluation in Clinical Practice*, Vol. 10(2), pp. 307 – 312. <https://doi.org/10.1111/j..2002.384.doc.x>
- Lanzante, J. R. (2005). A Cautionary Note on the Use of Error Bars. *Journal of Climate*, Vol 18(17), pp. 3699 – 3703. <https://doi.org/10.1175/JCLI3499.1>
- Lemyre, F. C., Chalifoux, K., Desharnais, B., & Mireault, P. (2021). Squaring Things Up with R²: What It Is and What It Can (and Cannot) Tell You. *Journal of Analytical Toxicology*, Vol. 46(4), pp. 443 – 448. <https://doi.org/10.1093/jat/bkab036>
- Li, S., & Kallas, Z. (2021). Meta-analysis of consumers' willingness to pay for sustainable food products. *Appetite*, Vol. 163, pp. 1 – 11. <https://doi.org/10.1016/j.appet.2021.105239>
- Lu, Z. Y., & Hsee, C. K. (2019). Less willing to pay but more willing to buy: How the elicitation method impacts the valuation of a promotion. *Journal of Behavioral Decision Making*, Vol. 32(3), pp. 334 – 335. <https://doi.org/10.1002/bdm.2115>

- Luchs, M. G., Mick, D. G., & Haws, K. L. (2021). Consumer Wisdom for Personal Well-Being and the Greater Good: Scale Development and Validation. *Journal of Consumer Psychology*, Vol. 31(3), pp. 587 – 611. <https://doi-org.ezproxy.library.bi.no/10.1002/jcpy.1224>
- Luchs, M. G., Naylor, R. W., Irwin, J. R., & Raghunathan, R. (2010). The Sustainability Liability: Potential Negative Effects of Ethicality on Product Preference. *Journal of Marketing*, Vol. 74(5), pp. 18 – 31. <https://doi.org/10.1509/jmkg.74.5.018>
- Malhotra, N. K. (2010). *Marketing Research – An Applied Orientation* (6th ed.). Prentice Hall.
- McGuigan, J. R., Moyer, R. C., & Harris, F. (2017). *Managerial Economics – Applications, Strategies, and Tactics* (14th ed.). Cengage Learning.
- McRaven, W. H. (2014). *University of Texas at Austin 2014 Commencement Address – Admiral William H. McRaven* [YouTube-video posted by Texas Exes, 2014]. YouTube. <https://youtu.be/pxBQLFLei70?t=327>
- Miller, K. (2020, December 8). The triple bottom line: what it is & why it's important. *Harvard Business School*. <https://online.hbs.edu/blog/post/what-is-the-triple-bottom-line>
- Monsen, S. C., Korgerud, J. H., & Wærsland, T. (2021). *When the Upper Class' Conspicuous Consumption Turns Inconspicuous: The Consequences for the Middle Class* [Unpublished term paper in GRA 6438 – Research Methodology - Marketing]. BI Norwegian Business School.
- Moorman, C. (2018). *Call for Papers | Journal of Marketing Special Issue: Better Marketing for a Better World*. American Marketing Association. <https://www.ama.org/2018/11/20/call-for-papers-journal-of-marketing-special-issue-better-marketing-for-a-better-world/>
- Mortimer, G. (2020). *Climate explained: are consumers willing to pay more for climate-friendly products?* The Conversation. <https://theconversation.com/climate-explained-are-consumers-willing-to-pay-more-for-climate-friendly-products-146757>
- Morwitz, V. G., Steckel, J. H., & Gupta, A. (2007). When do purchase intentions predict sales? *International Journal of Forecasting*, Vol. 23(3), pp. 347 – 364. <https://doi.org/10.1016/j.ijforecast.2007.05.015>
- Moser, A. K. (2015). Thinking green, buying green? Drivers of pro-environmental purchasing behavior. *Journal of Consumer Marketing*, Vol. 32(3), pp. 167 – 175. <http://dx.doi.org/10.1108/JCM-10-2014-1179>
- Nordic Ecolabel (2022). *The Official Ecolabel of the Nordic Countries*. Nordic Ecolabel. <https://www.nordic-ecolabel.org/>

- Park, H. J., & Lin, L. M. (2020). Exploring the attitude-behavior gap in sustainable consumption: comparison of recycled and upcycled fashion products. *Journal of Business Research*, Vol. 117, pp. 623 – 628. <https://doi.org/10.1016/j.jbusres.2018.08.025>
- Payton, M. E., Greenstone, M. H., & Schenker, N. (2003). Overlapping confidence intervals or standard error intervals: What do they mean in terms of statistical significance? *Journal of Insect Science*, Vol. 3(34). <https://doi.org/10.1093/jis/3.1.34>
- Rao, A. R., & Bergen, M. E. (1992). Price premium variations as a consequence of buyers' lack of information. *Journal of Consumer Research*, Vol. 19(3), pp. 412 – 423. <https://doi.org/10.1086/209311>
- Ritchie, H. (2020). *Cars, planes, trains: where do CO₂ emissions from transport come from?* Our World in Data. <https://ourworldindata.org/co2-emissions-from-transport>
- Ritchie, H., & Roser, M. (2022). *Smoking*. Our World in Data. <https://ourworldindata.org/smoking>
- Robinson, L. R. (2021). Combining multiple measures into a summary index: A step toward more reliable measurement. *Muscle & Nerve*, Vol 65(2), pp. 135 – 136. <https://doi.org/10.1002/mus.27456>
- Romani, S. (2022). *Food and household sustainability scales* [Unpublished: these scales were provided through e-mail correspondence with my thesis supervisor (prof. Romani)].
- Sammer, K., & Wüstenhagen, R. (2006). The influence of eco-labelling on consumer behavior – results of a discrete choice analysis for washing machines. *Business Strategy and the Environment*, Vol. 15(3), pp. 185 – 199. <https://doi.org/10.1002/bse.522>
- Sekeran, U., & Bougie, R. (2016). *Research Methods For Business: A Skill uilding Approach* (7th ed.). Wiley.
- Siebert, A., Gopaldas, A., & Lindrigde, A. (2020). Customer Experience Journeys: Loyalty Loops Versus Involvement Spirals. *Journal of Marketing*, Vol. 84(4), pp. 45 – 66. <https://doi.org/10.1177/0022242920920262>
- Statista (2022). *Share of consumers willing to pay more for sustainable products in France in 2017, by type of product*. Statista. <https://www.statista.com/statistics/1078028/consumers-pay-more-expensive-products-durable-by-category-la-france/>
- Stobierski, T. (2020, October 20). Willingness to pay: what it is & how to calculate. *Harvard Business School*. <https://online.hbs.edu/blog/post/willingness-to-pay>
- Sullivan, L. (2022). *Power and Sample Size Determination*. Boston University School of Public Health. https://sphweb.bumc.bu.edu/otlt/mph-modules/bs/bs704_power/bs704_power_print.html
-

- Sundt, S., & Rehdanz, K. (2015). Consumers' willingness to pay for green electricity: A meta-analysis of the literature. *Energy Economics*, Vol. 51, pp. 1 – 8. <https://doi.org/10.1016/j.eneco.2015.06.005>
- Trudel, R. (2018). Sustainable consumer behavior. *Consumer Psychology Review*, Vol. 2(1), pp. 85 – 96. <https://doi.org/10.1002/arcp.1045>
- United Nations Development Programme (2022). *The SDGs in Action*. United Nations Development Programme. <https://www.undp.org/sustainable-development-goals>
- Urbany, J. E., Madden, T. J. & Dickson, P. R. (1989). All's Not Fair in Pricing: An Initial Look at the Dual Entitlement Principle. *Marketing Letters*, Vol. 1, pp. 17 – 25. <https://doi.org/10.1007/BF00436145>
- Van Gelder, K. (2021). *Share of consumers willing to pay extra for sustainable products the Netherlands 2020*. Statista. <https://www.statista.com/statistics/934176/share-of-consumers-willing-to-pay-extra-for-sustainable-products-in-the-netherlands/>
- Volchok, E. (2020). *Clear-Sighted Statistics: Module 12: Estimating Sample Sizes (slides)*. CUNY Queensborough Community College. https://academicworks.cuny.edu/cgi/viewcontent.cgi?article=1157&context=qb_oers
- White, K., Hardisty, D. J., & Habib, R. (2019). *The Elusive Green Consumer*. Harvard Business Review. <https://hbr.org/2019/07/the-elusive-green-consumer>
- WHO. (2021). *Obesity and overweight*. World Health Organization. <https://www.who.int/news-room/fact-sheets/detail/obesity-and-overweight>
- WHO. (2020). *Physical activity*. World Health Organization. <https://www.who.int/news-room/fact-sheets/detail/physical-activity>
- Wolny, J., & Charoensuksai, N. (2014). Mapping customer journeys in multichannel decision-making. *Journal of Direct, Data and Digital Marketing Practice*, Vol. 15, pp. 317 – 326. <https://doi.org/10.1057/dddmp.2014.24>
- World Population Review (2022). *Most Environmentally Friendly Countries 2022*. World Population Review. <https://worldpopulationreview.com/country-rankings/most-environmentally-friendly-countries>
- World Trade Organization (2021). *Trade and Climate Change, Information Brief No. 4*. World Trade Organization. https://www.wto.org/english/news_e/news21_e/clim_03nov21-4_e.pdf
- Yang, S., Hu, W., Mupandawana, M., & Liu, Y. (2012). Consumer Willingness to Pay for Fair Trade Coffee: A Chinese Case Study. *Journal of Agricultural and Applied Economics*, Vol. 44(1), pp. 21 – 34. <https://doi.org/10.1017/S1074070800000146>

12. Appendices

Appendix 1: Pilot study survey flow and questionnaire

Block: Introduction & consent (4 Questions)

BlockRandomizer: 1 - Evenly Present Elements

Group: Experiment 1 - Household

EmbeddedData

ConditionValue will be set from Panel or URL.

BlockRandomizer: 1 – Evenly Present Elements

Group: Experiment 1 - Sustainable household

EmbeddedData

Condition = Sust_household

Block: Experiment 1A: Sustainable household (3 Questions)

Group: Experiment 1 - Traditional household

EmbeddedData

Condition = Trad_household

Block: Experiment 1B: Traditional household (3 Questions)

Block: Post-experiment 1 questionnaire (4 Questions)

Group: Experiment 2 - Food

BlockRandomizer: 1 - Evenly Present Elements

Group: Experiment 2 - Sustainable food

EmbeddedData

Condition = Sust_food

Block: Experiment 2A: Sustainable food (3 Questions)

Group: Experiment 2 - Traditional food

EmbeddedData

Condition = Trad_food

Block: Experiment 2B: Traditional food (3 Questions)

Standard: Post-experiment 2 questionnaire (4 Questions)

Standard: Demographics (8 Questions)

Group: Attitudes

Standard: General sustainability (2 Questions)

Branch: New Branch

If

If Imagine someone at their local grocery store. That person is looking for a new laundry detergent. Is Displayed

Or Imagine someone at their local grocery store. That person is looking for a new laundry detergent. Is Displayed

Standard: Household sustainability (specific) (2 Questions)

Branch: New Branch

If

If Imagine someone at their local grocery store. That person is looking to buy some ground beef for... Is Displayed

Or Imagine someone at their local grocery store. That person is looking to buy some ground beef for... Is Displayed

Standard: Food sustainability (specific) (2 Questions)

Standard: Manipulation checks & ending (4 Questions)

EndSurvey: Default

Start of Block: Introduction & consent

Before you proceed to the survey, please complete the captcha below.

Page Break

Welcome to this online experiment!

Study overview

The experiment will take approximately 5-7 minutes to complete. The goal of this study is to investigate recent trends in consumer behavior, and is a part of my master thesis in marketing at the Luiss Guido Carli University in Rome, Italy.

Anonymity and confidentiality

Confidentiality is guaranteed, and all your responses will be anonymous. **No personal data** (such as your IP address, name, etc.) **will be collected, nor linked to your responses**. All data collected will be processed in compliance with the General Data Protection Regulation (GDPR).

Data processing

The data collected in this experiment will only be processed and used for the purpose of the thesis. Others, such as other researchers, may use the data in its anonymised form for later use.

Participation

Participation in this study is voluntary, and should only be done individually. It is recommended to do the experiment in a place where you will not be disturbed. Your progress and data will be saved for one week, and then deleted if not completed. You can at any point return to the study within that time frame to complete the experiment. If you wish to withdraw your data after completing the survey, or have any types of questions, please contact me by e-mail: jens.korgerud@studenti.luiss.it

An €100 Amazon gift card be gifted to one randomly selected participant who completes the experiment. Full completion is required to be eligible for the prize. To participate in the draw, you will have to provide your e-mail at the end of the study in an external page to ensure full anonymity.

Thank you! Your participation is greatly appreciated!

This research has been reviewed according to LUISS Guido Carli University procedures for research involving human subjects.

I have read and understood the information above, and give my consent to participate in this online experiment by my own free will:

Yes (1)

Page Break

[Currency: not visible for the participant]

Before starting the experiment, what type of currency do you typically use?

EUR - Euro (1)

NOK - Norwegian Crown (2)

USD - US Dollar (3)

GBP - Great British Pound (4)

Other, please specify: (5) _____

End of Block: Introduction & consent

Start of Block: Experiment 1A: Sustainable household

Imagine someone at their local grocery store. That person is looking for a new laundry detergent.

Page Break

1 liter of product = 35 UK fl oz = 34 US fl oz = enough for 28 wash.

The following laundry detergent, Go, contains 1000 ml (1 liter) of product, which equals to 28 uses, and the bottle cap works as a measuring cup. The laundry detergent is recognised by the EU Ecolabel and the Nordic Ecolabel for being sustainably produced and Co2 neutral. All ingredients are organic and eco-friendly.

You can proceed in 20 seconds.



End of Block: Experiment 1A: Sustainable household

Start of Block: Experiment 1B: Traditional household

Imagine someone at their local grocery store. That person is looking for a new laundry detergent.

Page Break

1 liter of product = 35 fl oz (UK) = 34 fl oz (US) = enough for 28 wash.

The following laundry detergent, Go, contains 1000 ml (1 liter) of product, which equals to 28 uses, and the bottle cap works as a measuring cup.

You can proceed in 20 seconds.



End of Block: Experiment 1B: Traditional household

Start of Block: Post-experiment 1 questionnaire



[WTP Household: not visible for the participant]

In the same currency you provided at the start, what is the maximum price you think an average person from your country would be willing to pay for this product? Please use numbers only.

[WTB household: not visible for the participant]

How likely/unlikely do you think an average person from your country would purchase this product at the given price you answered above?

- Very unlikely (1)
 - Moderately unlikely (2)
 - Slightly unlikely (3)
 - Neither likely nor unlikely (4)
 - Slightly likely (5)
 - Moderately likely (6)
 - Very likely (7)
-

[Product attractiveness – Household: not visible for the participant]

How attractive/unattractive do you think an average person from your country would find this product?

- Very unattractive (1)
 - Moderately unattractive (2)
 - Slightly unattractive (3)
 - Neither attractive nor unattractive (4)
 - Slightly attractive (5)
 - Moderately attractive (6)
 - Very attractive (7)
-



[Attention check: not visible for the participant]

What is 5 + 5? Please select the correct number to verify your attention.

- 10 (1)
- 20 (2)
- 30 (3)
- 40 (4)
- 50 (5)

End of Block: Post-experiment 1 questionnaire

Start of Block: Experiment 2A: Sustainable food

Imagine someone at their local grocery store. That person is looking to buy some ground beef for today's dinner.

Page Break

The following package contains 400 grams of lean, fresh, organic ground beef. In addition to being certified organic, it is animal welfare approved by AGW.

You can proceed in 20 seconds.



End of Block: Experiment 2A: Sustainable food

Start of Block: Experiment 2B: Traditional food

Imagine someone at their local grocery store. That person is looking to buy some ground beef for today's dinner.

Page Break

The following package contains 400 grams of lean, fresh ground beef.

You can proceed in 20 seconds.



End of Block: Experiment 2B: Traditional food

Start of Block: Post-experiment 2 questionnaire



[Food WTP: not visible for the participant]

In the same currency you provided at the start, what is the maximum price you think an average person from your country would be willing to pay for this product? Please use numbers only.

[Food WTB: not visible for the participant]

How likely/unlikely do you think an average person from your country would purchase this product at the given price you answered above?

- Very unlikely (1)
 - Moderately unlikely (2)
 - Slightly unlikely (3)
 - Neither likely nor unlikely (4)
 - Slightly likely (5)
 - Moderately likely (6)
 - Very likely (7)
-

[Product attractiveness – Food: not visible for the participant]

How attractive/unattractive do you think an average person from your country would find this product?

- Very unattractive (1)
 - Moderately unattractive (2)
 - Slightly Unattractive (3)
 - Neither attractive nor unattractive (4)
 - Slightly attractive (5)
 - Moderately attractive (6)
 - Very attractive (7)
-



[Attention check: not visible for the participant]

What is $5 + 5$? Please select the correct number to verify your attention.

- 10 (1)
- 20 (2)
- 30 (3)
- 40 (4)
- 50 (5)

End of Block: Post-experiment 2 questionnaire

Start of Block: Demographics



[Age: not visible for the participant]

What is your age?

[Gender: not visible for the participant]

How do you describe yourself?

- Male (1)
 - Female (2)
 - Non-binary / third gender (3)
 - Prefer to self-describe (4) _____
 - Prefer not to say (5)
-

[Employment status: not visible for the participant]

What best describes your employment status over the last three months?

- Working full-time (1)
 - Working part-time (2)
 - Unemployed and looking for work (3)
 - A homemaker or stay-at-home parent (4)
 - Student (5)
 - Retired (6)
 - Other (7)
-

[Marital status: not visible for the participant]

What is your current marital status?

- Married (1)
 - Living with a partner (2)
 - Widowed (3)
 - Divorced/Separated (4)
 - Never been married (5)
-



[Household income: not visible for the participant]

After taxes, what is your household's approximate average income per year? Use your own currency. Please use numbers only.

(If you live with friends or in a student housing, please just consider your personal income)



[Nationality: not visible for the participant]

Where are you from?

▼ Afghanistan (1) ... Zimbabwe (1357)

[Vegetarian: not visible for the participant]

Do you eat meat?

Yes (1)

No (2)

[Education level: not visible for the participant]

What is the highest degree or level of education you have completed?

High school diploma (or equivalent) (1)

Some university / college credits, no degree (2)

1 year of higher education (3)

Bachelor's degree (or equivalent) (4)

Master's degree (or equivalent) (5)

Doctorate degree (6)

None of the above (7)

End of Block: Demographics

Start of Block: General sustainability



[General_sustainability: not visible for the participant]

Please indicate the extent of which you agree or disagree with the following statements:

	Strongly disagree (1)	Disagree (2)	Somewhat disagree (3)	Neither agree nor disagree (4)	Somewhat agree (5)	Agree (6)	Strongly agree (7)
I usually buy products from companies that promote environmental responsibility, even when they cost more. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My consumption behaviors do <i>not</i> consistently reflect my concern for the natural environment. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I usually do <i>not</i> buy products from companies that demonstrate that they share my ethical values. (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I spend time thinking about how we, as a global community, affect each other through our individual consumption choices. (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



[Attention check: not visible for the participant]

Which color are bananas? Please select 'yellow' to verify your attention.

- Yellow (1)
- Blue (2)
- Pink (3)
- White (4)
- Red (5)

End of Block: General sustainability

Start of Block: Household sustainability (specific)



[Household sustainability: not visible for the participant]

Please indicate the extent of which you agree or disagree with the following statements:

	Strongly disagree (1)	Disagree (2)	Somewhat disagree (3)	Neither agree nor disagree (4)	Somewhat agree (5)	Agree (6)	Strongly agree (7)
Usually, I throw all my garbage away in the same waste bin. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I often throw food away. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I dispose of empty batteries at dedicated battery collection points. (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I do <i>not</i> have green power at home. (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Before going to sleep, I usually do <i>not</i> switch off all lamps in my house. (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I normally leave devices such as the television on stand-by. (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

I save energy by sweeping my house instead of vacuuming. (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I save energy by using as little water as possible. (8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In order to save energy, I usually lower the heating in my home. (9)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I normally do <i>not</i> use products in my home that are environmentally friendly. (10)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



[Attention check: not visible for the participant]

What is 10 + 10? Please select the correct number to verify your attention.

- 10 (1)
- 20 (2)
- 30 (3)
- 40 (4)
- 50 (5)

End of Block: Household sustainability (specific)

Start of Block: Food sustainability (specific)



[Food sustainability: Not visible for the participant]

Please indicate the extent of which you agree or disagree with the following statements:

	Strongly disagree (1)	Disagree (2)	Somewhat disagree (3)	Neither agree nor disagree (4)	Somewhat agree (5)	Agree (6)	Strongly agree (7)
--	-----------------------	--------------	-----------------------	--------------------------------	--------------------	-----------	--------------------

I <i>rarely</i> purchase food that is obtained in an environmentally friendly way. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Food that is produced in a way that respects biodiversity is important. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Food should <i>not</i> be grown using sustainable agricultural practices. (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Food production should respect animal welfare. (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Food should be produced without the use of pesticides. (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Low carbon emissions do <i>not</i> matter for food production. (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Food should be produced in an unspoilt environment (e.g., should not use chemicals). (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Food waste is a <i>natural</i> part of food production. (8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It is important that food is packaged in an environmentally friendly way. (9)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I do not mind paying more for ecofriendly food. (10)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Food must be produced in respect of human rights. (11)

Food must be sold at a fair price for the producer. (12)

It is not important that the food keeps me healthy. (13)



[Attention check: not visible for the participant]

What color is the clear sky during daytime? Please select 'blue' to verify your attention.

- Green (1)
- Purple (2)
- Red (3)
- Blue (4)
- Pink (5)

End of Block: Food sustainability (specific)

Start of Block: Manipulation checks & ending

Display This Question:

If Imagine someone at their local grocery store. That person is looking for a new laundry detergent. Is Displayed

Or Or Imagine someone at their local grocery store. That person is looking for a new laundry detergent. Is Displayed

[Manipulation check: not visible for the participant]

When you reviewed the laundry detergent, to what extent did you perceive it to be sustainable or unsustainable?

- Very unsustainable (1)
 - Moderately unsustainable (2)
 - Slightly unsustainable (3)
 - Neither sustainable nor unsustainable (4)
 - Slightly sustainable (5)
 - Moderately sustainable (6)
 - Very sustainable (7)
-

Display This Question:

If Imagine someone at their local grocery store. That person is looking to buy some ground beef for... Is Displayed

Or Or Imagine someone at their local grocery store. That person is looking to buy some ground beef for... Is Displayed

[Manipulation check: not visible for the participant]

When you reviewed the ground beef, to what extent did you perceive it to be sustainable or unsustainable?

- Very unsustainable (1)
 - Moderately unsustainable (2)
 - Slightly unsustainable (3)
 - Neither sustainable nor unsustainable (4)
 - Slightly sustainable (5)
 - Moderately sustainable (6)
 - Very sustainable (7)
-

Page Break

[Sustainability knowledge: not visible for the participant]

How would you describe your own level of knowledge in terms of issues and/or concerns related to sustainability?

- Far below average (1)
 - Moderately below average (2)
 - Slightly below average (3)
 - Average (4)
 - Slightly above average (5)
 - Moderately above average (6)
 - Far above average (7)
-

Page Break

[General comment: not visible for the participant]

Do you have any comments or feedback to the survey and/or experiment? (Optional)

End of Block: Manipulation checks & ending

Appendix 2: Main study survey flow and questionnaire

EmbeddedData

PROLIFIC_PIDValue will be set from Panel or URL.

Block: Introduction & consent (3 Questions)

Branch: New Branch

If

If I have read and understood the information above, and give my consent to participate in this onli...

No Is Selected

EndSurvey: Default

Standard: Prolific ID (1 Question)

Standard: Currency (1 Question)

Group: Experiment 1 - Household

EmbeddedData

ConditionValue will be set from Panel or URL.

BlockRandomizer: 1 - Evenly Present Elements

Group: Experiment 1 - Sustainable household

EmbeddedData

Condition = Sust_household

Block: Experiment 1A: Sustainable household (3 Questions)

Group: Experiment 1 - Traditional household

EmbeddedData

Condition = Trad_household

Block: Experiment 1B: Traditional household (3 Questions)

Block: Post-experiment 1 questionnaire (4 Questions)

Standard: Demographics (9 Questions)

BlockRandomizer: 2 - Evenly Present Elements

Standard: General sustainability (1 Question)

Standard: Household sustainability (specific) (1 Question)

Standard: Manipulation checks & ending (5 Questions)

EndSurvey: Default

Start of Block: Introduction & consent

Before you proceed to the survey, please complete the captcha below.

Page Break

Introduction Welcome to this online experiment!

Study overview

The experiment will take approximately 5-7 minutes to complete. The goal of this study is to investigate recent trends in consumer behavior, and is a part of my master thesis in marketing at the Luiss Guido Carli University in Rome, Italy.

Anonymity and confidentiality

Confidentiality is guaranteed, and all your responses will be anonymous. **No personal data** (such as your IP address, name, etc.) **will be collected, nor linked to your responses.** For Prolific users, your Prolific ID will be recorded. All data collected will be processed in compliance with the General Data Protection Regulation (GDPR).

Data processing

The data collected in this experiment will only be processed and used for the purpose of the thesis. Others, such as other researchers, may use the data in its anonymised form for later use.

Participation

Participation in this study is voluntary, and should only be done individually. It is recommended to do the experiment in a place where you will not be disturbed. Your progress and data will be saved for one week, and then deleted if not completed. You can at any point return to the study within that time frame to complete the experiment. If you wish to withdraw your data after completing the survey, or have any types of questions, please contact me by e-mail: jens.korgerud@studenti.luiss.it

Thank you! Your participation is greatly appreciated!

This research has been reviewed according to LUISS Guido Carli University procedures for research involving human subjects.

[Consent: not visible for the participant]

I have read and understood the information above, and give my consent to participate in this online experiment by my own free will:

Yes (1)

No (2)

End of Block: Introduction & consent

Start of Block: Prolific ID



What is your **Prolific ID**? Non-prolific users can skip this step.
Please note that this response should auto-fill with the correct ID.

End of Block: Prolific ID

Start of Block: Currency



[Currency: not visible for the participant]

Before starting the experiment, what type of currency do you typically use?

- EUR - Euro (1)
- NOK - Norwegian Crown (2)
- USD - US Dollar (3)
- GBP - Great British Pound (4)
- Other, please specify: (5) _____

End of Block: Currency

Start of Block: Experiment 1A: Sustainable household

The experiment will now start. Please review the information and product carefully before proceeding.

Imagine someone at their local grocery store. That person is looking for a new laundry detergent.

Page Break

1 liter of product = 35 UK fl oz = 34 US fl oz = enough for 28 wash.

The following laundry detergent, Go, contains 1000 ml (1 liter) of product, which equals to 28 uses, and the bottle cap works as a measuring cup. The laundry detergent is recognised by the EU Ecolabel and the Nordic Ecolabel for being sustainably produced and Co2 neutral. All ingredients are organic and eco-friendly.

You can proceed in 20 seconds.



End of Block: Experiment 1A: Sustainable household

Start of Block: Experiment 1B: Traditional household

The experiment will now start. Please review the information and product carefully before proceeding.

Imagine someone at their local grocery store. That person is looking for a new laundry detergent.

Page Break

1 liter of product = 35 fl oz (UK) = 34 fl oz (US) = enough for 28 wash.

The following laundry detergent, Go, contains 1000 ml (1 liter) of product, which equals to 28 uses, and the bottle cap works as a measuring cup.

You can proceed in 20 seconds.



End of Block: Experiment 1B: Traditional household

Start of Block: Post-experiment 1 questionnaire



[WTP household: not visible for the participant]

In the same currency you provided at the start, what is the maximum price you think an average person from your country would be willing to pay for this product? Please use numbers only.



[WTB: not visible for the participant]

Please provide your answers to the statements below:

	Very low (1)	Low (2)	Somewhat low (3)	Neutral (4)	Somewhat high (5)	High (6)	Very high (7)
The likelihood of an average person from my country to purchase the product is: (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The probability that an average person from my country would consider buying the product is: (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
An average person from my country's willingness-to-buy the product is: (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Please select the 'neutral' checkmark to verify your attention. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



[WTB: not visible for the participant]

Please provide your answers to the statements below:

	Strongly disagree (1)	Disagree (2)	Somewhat disagree (3)	Neither agree nor disagree (4)	Somewhat agree (5)	Agree (6)	Strongly agree (7)
An average person from my country would consider buying the product. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If an average person from my country was looking to buy a new laundry detergent, he/she would consider buying the one shown to me. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Please select the 'strongly agree' checkmark to verify your attention. (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

[Product attractiveness – household: not visible for the participant]

How attractive/unattractive do you think an average person from your country would find this product?

- Very unattractive (1)
- Moderately unattractive (2)
- Slightly unattractive (3)
- Neither attractive nor unattractive (4)
- Slightly attractive (5)
- Moderately attractive (6)
- Very attractive (7)

End of Block: Post-experiment 1 questionnaire

Start of Block: Demographics



[Age: not visible for the participant]

What is your age?

[Gender: not visible for the participant]

How do you describe yourself?

- Male (1)
 - Female (2)
 - Non-binary / third gender (3)
 - Prefer to self-describe (4) _____
 - Prefer not to say (5)
-

[Employment status: not visible for the participant]

What best describes your employment status over the last three months?

- Working full-time (1)
 - Working part-time (2)
 - Unemployed and looking for work (3)
 - A homemaker or stay-at-home parent (4)
 - Student (5)
 - Retired (6)
 - Other (7)
-

[Marital status: not visible for the participant]

What is your current marital status?

- Married (1)
 - Living with a partner (2)
 - Widowed (3)
 - Divorced/Separated (4)
 - Never been married (5)
-



[Household income: not visible for the participant]

After taxes, what is your household's approximate average income per year? Use your own currency. Please use numbers only.

(If you live with friends or in a student housing, please just consider your personal income)



[Nationality: not visible for the participant]

Where are you from?

▼ Afghanistan (1) ... Zimbabwe (1357)

[Vegetarian: not visible for the participant]

Do you eat meat?

Yes (1)

No (2)

[Education level: not visible for the participant]

What is the highest degree or level of education you have completed?

High school diploma (or equivalent) (1)

Some university / college credits, no degree (2)

1 year of higher education (3)

Bachelor's degree (or equivalent) (4)

Master's degree (or equivalent) (5)

Doctorate degree (6)

None of the above (7)

[Attention check: not visible for the participant]

Please answer the following equation to verify your attention. Five plus five equals what?

End of Block: Demographics

Start of Block: General sustainability



[General sustainability: not visible for the participant]

Please indicate the extent of which you agree or disagree with the following statements:

	Strongly disagree (1)	Disagree (2)	Somewhat disagree (3)	Neither agree nor disagree (4)	Somewhat agree (5)	Agree (6)	Strongly agree (7)
I usually buy products from companies that promote environmental responsibility, even when they cost more. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My consumption behaviors consistently reflect my concern for the natural environment. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I usually buy products from companies that demonstrate that they share my ethical values. (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I spend time thinking about how we, as a global community, affect each other through our individual consumption choices. (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Please select the 'strongly disagree' checkmark to verify your attention. (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

End of Block: General sustainability

Start of Block: Household sustainability (specific)



[Household sustainability: not visible for the participant]

Please indicate the extent of which you agree or disagree with the following statements:

	Strongly disagree (1)	Disagree (2)	Somewhat disagree (3)	Neither agree nor disagree (4)	Somewhat agree (5)	Agree (6)	Strongly agree (7)
Usually, I throw all my garbage away in the same waste bin. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I often throw food away. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I dispose of empty batteries at dedicated battery collection points. (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have green power at home. (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Before going to sleep, I usually switch off all lamps in my house. (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I normally leave devices such as the television on stand-by. (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I save energy by sweeping my house instead of vacuuming. (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I save energy by using as little water as possible. (8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In order to save energy, I usually lower the heating in my home. (9)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I normally do <i>not</i> use products in my home that are environmentally friendly. (10)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please select the 'somewhat disagree' checkmark to verify your attention. (11)

End of Block: Household sustainability (specific)

Start of Block: Manipulation checks & ending

[Manipulation check: not visible for the participant]

When you reviewed the laundry detergent, to what extent did you perceive it to be sustainable or unsustainable?

- Very unsustainable (1)
- Moderately unsustainable (2)
- Slightly unsustainable (3)
- Neither sustainable nor unsustainable (4)
- Slightly sustainable (5)
- Moderately sustainable (6)
- Very sustainable (7)

Page Break

[Sustainability knowledge: not visible for the participant]

How would you describe your own level of knowledge in terms of issues and/or concerns related to sustainability?

- Far below average (1)
 - Moderately below average (2)
 - Slightly below average (3)
 - Average (4)
 - Slightly above average (5)
 - Moderately above average (6)
 - Far above average (7)
-

[Price familiarity: not visible for the participant]

How familiar are you with the prices of laundry detergents?

- Very unfamiliar (1)
 - Unfamiliar (2)
 - Slightly unfamiliar (3)
 - Neither familiar nor unfamiliar (4)
 - Slightly familiar (5)
 - Familiar (6)
 - Very familiar (7)
-

Page Break

[General comment: not visible for the participant]

Do you have any comments or feedback to the survey and/or experiment? (Optional)

When you click 'next', the study will be completed. Thank you for participating!
Please note that you must click 'next' to record your participation.

Please contact me by e-mail if you have any questions: jens.korgerud@studenti.luiss.it

End of Block: Manipulation checks & ending

13. Extended summary

13.1 Introduction and literature review

The thesis investigated how the consumers' *general* and *specific* attitudes toward sustainability affect their Willingness-to-Buy (WTB) and Willingness-to-Pay for sustainable products. Consumer behavior is complex, hard to predict, and inconsistent since we as humans are irrational, influenced by numerous factors that are often 'hidden' behind a complex myriad of social and physiological mechanisms. Research and survey data have revealed that consumers increasingly report favorable attitudes, preferences, and intentions toward purchasing sustainable products; however, the consumers do not follow through. This issue is commonly referred to as the 'attitude-intention' and 'intention-action' gap, which has received major attention among researchers worldwide to secure sustainable development, as consumption stands for a significant part of the overall CO₂ emissions, in addition to contributing to issues related to social sustainability.

Consumers' attitudes have been frequently investigated as a mechanism to predict sustainable behavior, however, have yielded inconsistent results. Ajzen & Fishbein (1977) and Frymier & Nadler (2017) criticize how researchers measure attitudes, as it is commonly measured on a general level which fails to capture the consumers' *true* attitude towards an attitudinal object as consumer attitudes are fragmented across a behavioral domain. To succeed with predictions, a corresponding consistency in the level of specificity between the attitude that is measured and the attitudinal object is needed.

13.1.1 Complex human behavior: the inconsistent consumer

We as humans are highly complex, unpredictable, and irrational beings. The more we can predict the consumers' future behaviors, the more successful our marketing efforts become. If we were able to predict our consumers' behavior with a complete success rate, we would be living in a perfect world. (Un)fortunately, that is not the case, which is what makes marketing exciting. Along the way of the consumers' complex decision journeys, their intentions and actions are influenced by numerous factors. Psychological factors are strong behavioral influences, such as our attitudes and beliefs, needs, motives, personality, and cognition, all influenced by our surroundings, such as our friends and family, the weather, advertisement, and TV. Ultimately, the sole purpose of marketing is to identify as many of these factors as possible that can help us understand the consumers' next move, which can aid in improving the companies' offerings and customer experience, thereby providing more value in the eyes of the consumers. Ultimately, identifying factors that can help us better predict future consumer behaviors is of high importance for both scholars and practitioners, especially in making consumption greener and limiting the negative consequences of consumption.

13.1.2 Sustainable consumer behavior

Consumers increasingly report positive attitudes and intentions toward sustainable products (Park & Lin, 2020; Deloitte, 2021). Over the past decades, environmental concerns have received much attention from

policymakers and researchers worldwide due to global warming. The most recognized definition of sustainable development, made by the Brundtland Commission, is:

“Development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (Kostadinova, [2016](#)).

Overconsumption is one of the significant challenges to achieving sustainable development, as it depletes natural resources, pollutes, and, unfortunately, brings many social downsides, such as exploitation of labor. We, as consumers, are already consuming 30% more resources than the planet can reproduce, and the number is accelerating (Kostadinova, [2016](#)). Ultimately, green consumer behavior is an important research field to secure sustainable development. Building on the Brundtland report’s definition of sustainable development. Oslo Symposium developed a widely cited definition of sustainable consumption in 1994:

“The use of services and related products which respond to basic needs and bring a better quality of life while minimizing the use of natural resources and toxic materials as well as emissions of waste and pollutants over the life cycle of the service or product so as not to jeopardize the needs of future generations” (Kostadinova, [2016](#)).

Moreover, a distinction between sustainable and traditional products were made with respect to the SDGs. More specifically, a product is sustainable if it does not deplete natural and nonrenewable resources, does not directly harm the environment, and is made in a socially responsible way (Cyprus, [2020](#)). Traditional products, on the other hand, represents the opposite scale, where it does not actively consider the latter arguments.

Because sustainable consumption is an essential aspect of combating global warming and social injustice, policy makers, practitioners, and researchers have been primarily interested in researching consumers’ purchase intentions and green purchasing behavior. According to Joshi & Rahman’s ([2015](#)) literature review of green consumption since the 2000s, most research has been done by investigating factors that influence purchase intent (i.e., WTB) and purchasing behavior. The most common independent variables are consumer knowledge, norms, environmental concerns, attitudes, demographics, availability, price, purchase intention, and trust (Joshi & Rahman, [2015](#)).

13.1.3 Categorization of sustainable consumer behavior

Based on the overall impact on the SDGs, the thesis identifies four major categories of sustainable consumer behavior: (1) food, (2) household, (3) mobility, and (4), other consumer goods.

Food. It is estimated that 88 million tons of food goes to waste every year in Europe alone, corresponding to 173 kilograms per capita (European Commission, [2022a](#)), making it one of the most urgent areas to improve for securing sustainable development.

Household. The household category concerns everything that has to do with everyday life within the four walls of our own homes. This includes consumers' choices related to energy and water usage, chemicals used in soaps, laundry detergents, appliances, and furniture. In the U.S. alone, the carbon footprint of household energy usage is estimated to account for 20% of their total greenhouse emissions (Goldstein, Goundaridis, & Newell, [2020](#)).

Mobility. Technology has enabled us to travel more efficiently; however, it comes with a cost. Transportation is estimated to account for 24% of the global CO₂ emissions (Ritchie, [2020](#)). Within this category, we find personal transportation, such as driving a car, carpooling, public transportation, electric vehicles, air travel, boating, and so on.

Other consumer goods. For instance, purchasing clothing, makeup, electronics, books, and so on. Unfortunately, I was not successful in finding detailed data about emissions related to different product categories; however, the World Trade Organization ([2021](#)) argues that global trade stands for 20-30% of the global emissions.

13.1.4 Attitude and the attitude-behavior gap

Attitudes are often seen as one of the strongest behavioral influences towards a purchase, as they determine how we *think, feel, and act* toward an attitude object, either in a positive, neutral, or negative way (American Psychological Association, [2022a](#) & [2022b](#); Frymier & Nadler, [2017](#)). The attitude object can be a product, brand, company, music, artists, people, and so on. From a marketing perspective, a typical attitude object is a product or service itself and its related attributes. However, even though attitudes are considered a strong predictor of behavior, research has shown that the relationship between attitude and behavior tends to be inconsistent. Ultimately, this gap is commonly referred to as the “attitude-behavior gap”.

One of the most extensive critiques of the early research on attitudes and their effects on behavior is that it tended to be measured in a very general way, which made it hard to predict actual behavior, as it tends to be highly fragmented from the “general” measure (Frymier & Nadler, [2017](#)). For example, if we measure someone's attitudes towards sustainability in a general way, e.g., “*sustainable development is an important matter to me* (strongly agree – strongly disagree)”, we would, in practice, measure everything from the environment, sustainable food production, mobility (e.g., public transportation, air traffic, electric vehicles), social sustainability (e.g., fair trade, no child labor), and so on, under a single variable. Ultimately, this makes it hard to predict behavior and intentions, as people do not behave in “general” ways. Arguably, general measures are simplifications of reality. According to the principle of aggregation (Ajzen & Fishbein, [2005](#)), general attitudes only measure a behavioral domain (Frymier & Nadler, [2017](#), p. 47), which is the sum of all behaviors within a particular domain, such as sustainability.

Ajzen & Fishbein ([1977](#)), and Frymier & Nadler ([2017](#), pp. 45-46) argue that there should be a corresponding level of specificity between measuring attitudes and behavior to avoid measuring issues, as specific attitudes predict specific behavior. However, even though attitudes have been found to predict behavior, and that recent research has found several factors that can bridge the “attitude-behavior” gap, the gap tends to be strong

within green consumption (Morwitz, Steckel, & Gupta, [2007](#); Kostadinova, [2016](#)). Consumers report increasingly positive attitudes towards sustainable products; however, their behavior does not follow through even though they report a high purchase intention (Park & Lin, [2020](#); Deloitte, [2021](#)).

13.1.5 Willingness-to-Pay

Consumers' Willingness-to-Pay (WTP) can be defined as the maximum price a consumer is willing to pay for a good or service (Bendle, Farris, Pfeifer, & Reibstein, [2015](#); Stobierski, [2020](#)), which is also known as the consumers' reservation price.

Prices that lead to profits above the average are typically defined as *price premiums*; the excess price paid above the average "fair price" for identical products (Rao & Bergen, [1992](#)). Researchers argue that price premiums are the best way to measure brand equity, as it reflects the additional intangible value the brand provides to the product or service itself (Aaker, [1996](#); Anselmsson, Johansson, & Persson, [2007](#); Anselmsson, Bondesson, & Johansson, [2014](#)), and is considered a key metric in assessing pricing (Bendle, Farris, Pfeifer, & Reibstein, [2015](#)).

A more concrete, hands-on definition of a price premium is the percentage of which a product's price exceeds (or falls short of) a benchmark price (Bendle et al., [2015](#), pp. 226-228), mathematically expressed as: $Price\ premium\ (\%) = \frac{Product\ price\ (\$) - Benchmark\ price\ (\$)}{Benchmark\ price\ (\$)} \times 100\%$. The product price may be substituted by the consumers' willingness to pay, as firms ideally want the price to be identical to a customer segment's average WTP (their reservation price) to maximize profitability.

13.2 Research question

Compared to conventionally produced goods, sustainably produced alternatives such as fair-trade coffee, ecological food (e.g., eggs, milk, wheat, meat), environmentally friendly chemicals (e.g., laundry detergents, soap), and similar, are generally priced higher (Krososky, [2021](#)). Sustainable producers can not exclusively use the most cost-efficient production methods, as they also have to meet an extended set of quality standards with respect to sustainability. Ultimately, consumers are forced to pay a green price premium, where research has shown that consumers are willing to pay more for sustainable products in specific categories.

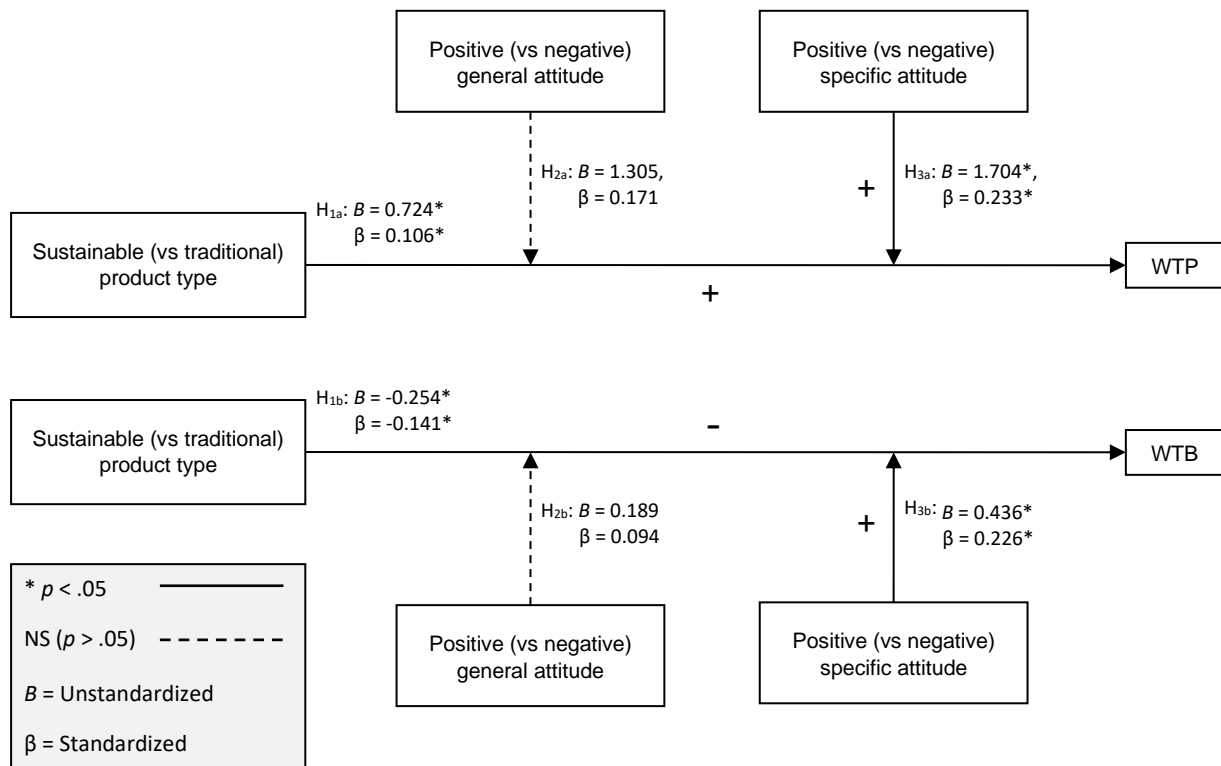
However, one of the most significant barriers to sustainable behavior is the intention-action gap between consumers' increasingly positive attitudes and intentions towards sustainable products and their actual purchasing behavior. Researchers argue that the understanding of this gap is still scarce. One of the major critiques of research on consumer attitudes is the lack of corresponding levels of specificity between the attitude and the attitudinal domain, which has been proposed to be why research on attitudes has yielded inconsistent results.

Moreover, the consumers' purchase intentions (such as WTB) have historically been the most common dependent variable in the research of sustainable consumption. However, considering that the consumers' WTP has been found to be one of the strongest antecedents of sustainable consumption, research should focus on investigating

underlying mechanisms that affect it. To the best of my knowledge, research has yet to discover how the consumers' attitudes on various levels of specificity affect their WTP for sustainable products. Thus, treating the consumers' WTP as a focal dependent variable in the scope of sustainable consumption is an interesting and novel approach, in addition to observing how the consumers' levels of WTB vary across the consumers' reported WTP for sustainable products. Ultimately, the thesis aims to investigate the following research question:

“How do consumers’ general and specific attitudes towards sustainability affect their Willingness-to-Pay and Willingness-to-Buy sustainable products? And, are specific attitudes better at predicting the outcomes?”

13.3 Conceptual framework and hypotheses



As discussed in the body of literature, consumers tend to have a different WTP for sustainable goods, compared to traditional goods. Therefore, it is reasonable to expect that consumers will have a higher WTP for sustainable products when the product categories are associated with gentleness-related attributes, such as laundry detergents and food, in addition to a higher WTB. Ultimately, the first hypotheses become:

- H_{1a} : Sustainable (vs traditional) products has a positive effect on the consumers' WTP ($\beta_1 > 0$).
- H_{1b} : Sustainable (vs traditional) products has a positive effect on the consumers' WTB ($\beta_1 > 0$).

Moreover, consumer behavior tends to be highly unpredictable, inconsistent, and irrational. Thus, it is therefore not likely that there solely exists a direct effect between product type and consumers' WTP and their WTB. Attitudes are generally considered a strong predictor of intentions and future behavior, and consumers' WTP has shown to be a strong antecedent for consumers' purchase intentions toward sustainable products. Ultimately,

it is reasonable to expect that general positive attitudes are able to positively moderate consumers' WTP for sustainable products, as general attitudes reflect consumers' attitudes towards a particular attitudinal domain, which in this case is sustainability. The subsequent hypotheses ultimately become:

- H_{2a}: Consumers' WTP for sustainable products (vs traditional) increases when having positive (vs negative), general attitudes towards sustainability ($\beta_3 > 0$).
- H_{2b}: Consumers' WTB for sustainable products (vs traditional) increases when having positive (vs negative), general attitudes towards sustainability ($\beta_3 > 0$).

According to the literature review, using general attitudes as a measure has proven controversial as it has yielded highly inconsistent results. By using general attitudes, we are measuring a *general* attitudinal domain, where the more specific attitudes within this domain are fragmented across specific types of sustainable behaviors. For instance, a consumer who reports positive general attitudes might not act sustainable across every aspect within the attitudinal domain, such as recycling, saving water, using green power, paying green price premiums, avoiding fast fashion, and so on. As Ajzen & Fishbein (1977) and Frymier & Nadler (2017) argued, there must be a corresponding level of specificity to avoid measuring error when aiming to predict intentions and future behavior. Additionally, it is also a possibility that consumers might overestimate their overall attitude towards sustainability when being asked general questions. Ultimately, using specific attitudes should yield greater levels of WTP and WTB for sustainable products. The final hypotheses ultimately become:

- H_{3a}: Consumers' WTP for sustainable products (vs traditional) increases when having positive (vs negative), specific attitudes towards sustainability ($\beta_3 > 0$).
- H_{3b}: Consumers' WTB for sustainable products (vs traditional) increases when having positive (vs negative), specific attitudes towards sustainability ($\beta_3 > 0$).

13.4 Methodology

13.4.1 Overview

To answer the research question and the subsequent hypotheses, an experimental research design was selected as the thesis aim to investigate causal mechanisms affecting consumers' WTP and WTB.

Two survey-based 2 (sustainable vs traditional product) \times 2 (positive vs negative attitude) between-subjects factorial experiments were carried out with respect to the causality requirements. The participants were randomly assigned to one out of two experimental conditions (sustainable vs traditional). Attitudes were not manipulated, however, were measured through a scale, and then divided into positive and negative attitudes based on a median split, which ultimately represents the second dimension of the experiment. Product type (sustainable vs traditional) is the independent variable (dimension 1), and the consumers' attitude towards sustainability was treated as the moderating variable (dimension 2). All participants were measured using

general and specific attitudinal measures. Lastly, the consumers' WTP and WTB were treated as the dependent variables.

Study 1: Household category

ATTITUDE

		Positive	Negative
		Sustainable laundry detergent shown to a participant with positive attitude toward sustainability	Sustainable laundry detergent shown to participants with negative attitude toward sustainability
PRODUCT TYPE	Sustainable		
	Traditional	Traditional laundry detergent shown to a participant with positive attitude toward sustainability	Traditional laundry detergent shown to a participant with negative attitude toward sustainability

Study 2: Food category

ATTITUDE

		Positive	Negative
		Sustainable ground beef shown to participants with positive attitudes toward sustainability	Sustainable ground beef shown to participants with negative attitudes toward sustainability
PRODUCT TYPE	Sustainable		
	Traditional	Traditional ground beef shown to participants with positive attitudes toward sustainability	Traditional ground beef shown to participants with negative attitudes toward sustainability

13.4.2 Pilot study

A pilot study was performed to evaluate the manipulations chosen for the main study and the operationalization of variables, and to determine the minimum sample size. The reasoning for conducting a pilot study was to achieve the highest possible degree of validity and reliability by minimizing systematic and random error and achieving consistency between the true score and the observed score of the phenomenon, according to the *true score model* (Malhotra, 2010, p. 286). The aim was to achieve a minimum of 30 randomly selected participants in each experimental condition ($n = 30 \times 4 \times 2 = 240$), as 30 participants are considered a sufficient compromise between statistical power, time consumption, and funding in pilot studies (Isaac & Michael, 1995; Hill, 1998; Lancaster, Dodd, & Williamson, 2004; Malhotra, 2010, ch. 12). Principal component analyses (i.e., factor analyses) and manipulation checks was applied, as well as the minimum sample size formula (Sullivan, 2022). However, over the course of the data collection with regard to the pilot, an unexpected issue occurred. Suspicions of fraudulent behavior in terms of survey bots were raised, compromising the validity of the pilot. Ultimately, after rinsing the data under strict review, the sample ended up on $n = 33$, which is a major limitation of the pilot. Nevertheless, the results of the pilot were used in addition to my own intuition to make determinations of improvements with respect to the main study.

The initial distribution strategy for the experiments was to use Facebook ads across the Nordic countries and the UK, however, when considering the issues related to fraudulent responses, I chose to switch the strategy to using Prolific to secure legitimate participants.

Based on the pilot, small changes were done to the main study, such as limiting the number of reversed scales, as well as deciding to remove one of the experiments (food), as the manipulation check in the household experiment yielded a stronger distinction between the sustainable and traditional version.

For the full operationalization and survey flow of the pilot study, please see [appendix 1](#).

13.4.3 Main study

The distribution of the main study yielded an initial sample size of $N = 274$ and ended up with $n = 224$ after rinsing the data in with respect to failed attention checks and extreme outliers in the dependent variables.

The Principal Component Analyses (PCAs) and Chronbach’s alpha revealed that WTB and general attitudes were valid and reliable measures, and that it was appropriate to merge the individual measures into their respective dimensions. However, the PCAs and Chronbach’s alpha also revealed that the measures of specific attitudes towards sustainability were poorly operationalized, implying a lower validity and reliability. Based on the analysis, only one question (“*I normally use products in my home that are environmentally friendly.*”) was selected to represent the specific attitudes dimension as the second moderator. This issue represents a limitation of the thesis.

The following table illustrates the descriptive statistics of the focal variables in the main study:

Descriptive statistics of focal variables

Independent variables		Dependent variables					
		WTP ^a			WTB ^b		
Product type		<i>M</i>	<i>SD</i>	<i>N</i>	<i>M</i>	<i>SD</i>	<i>N</i>
Sustainable		6.793	3.561	126	4.897	0.856	126
Traditional		6.069	3.286	127	5.151	0.937	127

Independent variables		Dependent variables					
		WTP ^a			WTB ^b		
Product type	General attitude	<i>M</i>	<i>SD</i>	<i>N</i>	<i>M</i>	<i>SD</i>	<i>N</i>
Sustainable	Positive	7.422	4.038	71	4.983	0.885	71
	Negative	5.980	2.653	55	4.786	0.813	55
Traditional	Positive	6.129	3.085	71	5.155	0.867	71
	Negative ^c	5.992	3.529	56	5.146	1.028	56

Independent variables		Dependent variables					
		WTP ^a			WTB ^b		
Product type	Specific attitude	<i>M</i>	<i>SD</i>	<i>N</i>	<i>M</i>	<i>SD</i>	<i>N</i>
Sustainable	Positive	7.238	3.880	82	5.022	0.833	82
	Negative	5.963	2.740	44	4.664	0.860	44
Traditional	Positive	5.910	3.030	80	5.123	0.993	80
	Negative ^c	6.339	3.674	47	5.200	0.842	47

^aWillingness-to-Pay (WTP) is expressed on a continuous scale, from 0 to $+\infty$.

^bWillingness-to-Buy (WTB) is expressed on a scale of 1-7, where 7 is very likely to buy, and 1 is very unlikely.

^cReference group for sustainable product type \times positive attitude

For the full questionnaire and survey flow of the main study, please see [appendix 2](#).

13.5 Findings and discussion

To summarize the key findings, H_{1a} documented that consumers, in general, were willing to pay significantly more for the sustainable laundry detergent (11.93%). H_{2a} was on the other hand statistically insignificant, meaning that *general* attitudes fail to moderate the consumers WTP for sustainable products. Additionally, building on finding from H_{1a}, H_{3a} was significant and showed that when consumers have positive *specific* attitudes towards sustainability, it positively moderated their WTP for sustainable products, increasing the green price premium to 14.17%. Moreover, H_{1b} proved that consumers, in general, were less likely to purchase the product (-4.93%). Similar to H_{2a}, H_{2b} was also insignificant, meaning that *general* attitudes failed to moderate the consumers' WTB of sustainable products. However, when the consumers had *positive specific* attitudes towards sustainability, it positively moderated their WTB. The WTB premium was still negative yet marginal (-3.40%), therefore having a small impact on the consumers' WTB. Given the relatively big increase in WTP, it is reasonable to assume that sustainable products, when marketed directly towards this segment, marketing managers have a significant market opportunity in terms of obtaining higher profit margins and increased unit sales, assuming that there is no intention-action gap.

Overall, the findings support the overall thesis, as general attitudes fail to moderate the sustainable (vs traditional) product's impact on the consumers' WTP. Instead, it depends on the consumers' specific attitudes towards sustainability.

The following table show the premiums that were identified in the analyses:

Premiums

Effects on Willingness-to-Pay	WTP premium %	Δ %
Direct effect of sustainable (vs traditional) product type on WTP:	11.93%	
Moderated effect of positive (vs negative) attitudes on the effect of sustainable (vs traditional) product type on WTP:	14.17%	2.24%
Effects on Willingness-to-Buy	WTB premium %	
Direct effect of sustainable (vs traditional) product type on WTB:	-4.93%	
Moderated effect of positive (vs negative) attitudes on the effect of sustainable (vs traditional) product type on WTB:	-3.40%	1.53%

13.6 Limitations and suggestions for further research

Inconsistency in the specific attitude measurement scales. In retrospect, the scales that were used to operationalize specific attitudes in the thesis could have been even more specific, as the factor analysis was highly inconsistent in terms of being poorly correlated, in addition to a poor Chronbach's alpha, ultimately

meaning that the validity and reliability of the findings are low. This also supports the overall discussion and gives more weight to the argument that human behavior is complex, inconsistent, and hard to predict. Managers and scholars that wish to perform market research need to be very careful when operationalizing attitudes to avoid uncorrelated scales that are supposed to represent the same attitudinal dimension (i.e., the attitudinal domain). If a consumer states that he or she has a positive attitude towards sustainability in general, the attitude might not be positive if we zoom in on specific areas within the attitudinal domain, such as using environmentally friendly products in our homes or purchasing environmentally friendly food. This limitation could have been avoided if the pilot study had a bigger sample; however, due to time limitations, I had to proceed with the main study using the findings of the pilot study in combination with my own intuition to make adjustments to the main study.

Future research should aim to achieve a proper sample size for the pilot study in order to secure more specificity in the scales so it is more tightly connected to the attitudinal domain in order to yield more consistency in the measurement scales. The more measures that can be merged into one dimension, the more precise it becomes as it reduces random error (Robinson, [2021](#)).

Differences across product categories. Another limitation to the study is that I was unfortunately not able to conduct the food study, which could have made it possible to see whether there are any differences across different product categories. However, considering that the literature review found food and laundry detergents (in addition to the thesis) to have a green price premium, it is more likely that these two categories would have yielded similar results. Testing with other categories, such as cars, energy, internet services, and banking, among others, is of interest for future research, as it is likely that the consumers' preferences, behavior, and intentions differ across product categories. For instance, Luchs et al. ([2010](#)) documented that consumers preferred traditional alternatives when the product category was associated with strength-related attributes, such as hand sanitizers and car tires. Ultimately, the findings of the thesis are not likely to be generalizable across different product categories. Future research should investigate more product categories and aim to find common grounds that can be applicable across categories, making it easier to identify price and WTB premiums for sustainable products.

Generation Z's WTB and WTP for sustainable products. Future research should investigate age differences with respect to WTB and WTP. More specifically, the literature review revealed that younger generations are more concerned with issues related to sustainability, and therefore, I hypothesize that younger consumers, depending on the product category, are more likely to purchase sustainable products. Additionally, it would be interesting to investigate younger segments' WTP and the price premiums they would be willing to pay for sustainable products. Considering that younger generations have less purchasing power due to not being as financially stable as older consumers, I hypothesize that younger generations are likely to not be willing to pay price premiums, regardless of having a higher WTB. Research that

investigates and aims to identify factors that could positively affect their WTP is of interest, as younger segments will become increasingly more important over time as they age and become the “grown-up” segment. According to the literature review, consumption has a significant impact on the overall climate footprint in addition to social issues; thus, given that younger segments are more concerned with sustainability, thereby having more positive attitudes towards sustainability, research on the topic is valuable as it could potentially have a significant impact on sustainable development.

Geographical and cultural differences. Environmental concerns, and concerns about sustainability, are highly fragmented across the world (World Population Review, [2022](#)), as it likely depends on several factors, such as the consumers’ purchasing power and their respective countries’ economy, cultures, and welfare levels. Thus, it is not likely that the finding in the study is generalizable across continents. Ultimately, a cross-cultural study investigating the consumers’ WTB and WTP is of interest, as it would map out how price and WTB premiums differ across the world. For instance, in Africa, it is not reasonable to expect that consumers, in general, are willing to pay price premiums for sustainable products, regardless of having positive attitudes towards sustainability, as the general welfare level is low, and more elementary needs are needed to be fulfilled before being able to prioritize sustainable development. I hypothesize that consumers in less wealthy countries have both lower levels of WTB and WTP and that these variables are not moderated by their attitudes towards sustainability.

Investigating the mechanisms with real purchasing data. Finally, investigating the mechanisms that were investigated in the thesis with real purchasing data, following the consumers’ WTP and WTB, is of high interest. As discussed in the literature review, the intention-action gap is highly present when investigating sustainable consumption. According to Moser ([2015](#)), WTP is a strong antecedent for purchasing sustainable products. Investigating how *specific* attitudes affect the consumers’ purchasing behavior through WTP and WTB as antecedents would be interesting, as we would observe how it affects the intention-action gap. Without real purchasing data, it is not possible to conclude whether WTP, in fact, is able to reduce the intention-action gap.

Investigating WTP using a reference price. According to Bolton et al. ([2013](#)), reference prices are important to consumers in their evaluations of prices and their perceptions of price fairness. The experiment in the thesis did not provide the participants with a reference price, which is likely to have induced more variance in the dependent variable (WTP). Including a reference price could potentially reduce the variance, yielding more precise estimates with smaller confidence intervals. However, providing a reference price could increase the possibility of biased estimates as it could be leading, as some consumers lack price knowledge in various product categories. It would be possible to investigate the consumers’ WTP both with and without a reference price, depending on the survey flow of the questionnaire. Ultimately, reference prices represent an interesting idea for future research.

Investigating WTB and WTP through various levels of sustainability. The last limitation of the study is that it was limited to only one level of sustainability with respect to the manipulations that were created for the experiment. Thus, future research should investigate how different levels of sustainability affect the consumers' WTB and WTP. From a global and development perspective, products should be as sustainable as possible, however, the more sustainable the product or business practices are, the more expensive are they likely to become, ultimately decreasing the overall profitability and consequently the attractiveness of the products from a commercial perspective. Thus, an interesting question is how much sustainability is needed to generate an effect in the outcome variables

13.7 Contributions and managerial relevance

Answering the research question contributes to the stream of marketing research in (green) consumer behavior, more specifically, how we can use marketing to make business more sustainable by investigating the antecedents and the process leading up to sustainable consumption. Additionally, the thesis has shown how important it is to operationalize attitudes on a specific level, achieving consistency between the measured attitude and the attitudinal object. In fact, the consumers' general attitudes did not predict the consumers' WTP and WTB, ultimately emphasizing the importance of the finding.

Not only is the research in the interest of scholars and policymakers but also managers since it will provide a deeper understanding of the mechanisms that lead to purchase, more specifically, the consumers' WTP (and WTP premiums) and WTB, ultimately reducing the risk of sustainable products becoming market failures. The intention-action gap between the consumers' increasingly positive attitudes and preferences towards sustainable products and their purchasing behavior is arguably one of the biggest issues within the field of green consumer behavior, and this research contributes in terms of a deeper understanding of the issue. For instance, the attitude-behavior gap was still present in the findings if we assume WTB to be the true estimator of purchasing behavior. However, the WTB was marginally negative, while the green WTP premium was considerably large for consumers with a positive specific attitude towards sustainability, meaning that there is a market opportunity for managers wishing to sell sustainable products.

More specifically, the price premium that the segment consisting of consumers with positive *specific* attitudes towards sustainability was willing to pay a 14.17% green price premium (an increase from 11.93% when ignoring attitudes), relative to what consumers with *negative* specific attitudes towards sustainability were willing to pay for the traditional version. However, consumers, in general, had a negative yet marginal WTB premium in relation to the sustainable product (-4.93%). The effect was, on the other hand, positively moderated by having positive specific attitudes, increasing the consumers' WTB by 1.53% to -3.40%. Consumers are still less willing to buy the sustainable product; however, the negative premium is marginal and, therefore, not likely to have a large impact on profitability, as the WTP premium is considerably large.

13.8 Conclusion

The aim of the thesis was to investigate the following research question:

“How do consumers’ general and specific attitudes towards sustainability affect their Willingness-to-Pay and Willingness-to-Buy sustainable products? And, are specific attitudes better at predicting the outcomes?”

In conclusion, the thesis found that consumers with positive, specific attitudes toward sustainability had a significantly larger WTP for sustainable products compared to what those with a negative, specific attitude were willing to pay for traditional products. More specifically, the findings are in support of the overall thesis, as we need a corresponding level of specificity between the attitude we measure, and the attitude object, in order to consistently predict an outcome, as only specific attitudes were able to consistently and significantly predict the outcomes at the 95% level. Furthermore, the thesis provides evidence of specific price premiums that segments with positive attitudes towards sustainability are willing to pay for sustainable products. Sustainable products are more expensive to produce, which can make these products unattractive to produce and offer due to insecurity in the pricing strategies, as selecting an inadequate price can, in the worst case, result in lower profitability, depending on the segment’s price elasticity. With a higher WTP, the price elasticity of the segment is lower and more inelastic, meaning that managers can, in fact, price sustainable laundry detergents higher without decreasing unit sales and ultimately weaken the overall profitability, depending on their costs.

Moreover, the same segment had a marginally lower WTB for the sustainable product compared to the opposing segment; consumers with negative attitudes’ and their WTB for the traditional product. Considering that the negative WTB was considerably low (-3.40%) compared to the segment’s WTP premium (14.17%), I argue that the profitability will still be higher if targeting sustainable products toward this segment.

The biggest limitation of the thesis is that the experiment failed to operationalize the specific attitude dimension, ultimately achieving poor levels of validity and reliability in a focal variable. Thus, it is hard to argue that the findings are generalizable and representative of the population. Nevertheless, this limitation gives clear evidence of how attitudes, in fact, should be measured in order to secure more consistency in the findings when investigating the role of attitudes in the scope of sustainable consumption, which has a major impact on sustainable development.

The thesis contributes to the stream of marketing research on green consumer behavior by addressing a largely overseen aspect of measuring attitudes. Attitudes do, in fact, have significant prediction capabilities of intentions, and future research on the topic should be careful when operationalizing attitudes, so it reaches consistency in the specificity between the attitude and the attitudinal object. Additionally, investigating WTP as a dependent variable in relation to intentions is a novel approach that yielded specific price premiums across important consumer segments. To achieve sustainable development, it is impossible to ignore consumer behavior, as it largely impacts the SDGs. Only by addressing the issue are we able to make a difference.