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# **The use of Neuromarketing technics for improving sustainable choices**

Case study of Sedas Plantekkøken Aps company

Thesis

Autumn 2022

Degree Programme International business



SEINÄJOKI UNIVERSITY OF APPLIED SCIENCES

## Thesis abstract

Degree Programme: School of Business and Culture

Specialisation: Business Administration

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Title of thesis: The use of Neuromarketing for improving sustainable choices. Case study of Sedas Plantekøkken

Supervisor: Dario Liberona

Year: 2022

Number of pages: 77

Number of appendices: 1

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*Neuromarketing* is the term that stands for the application of neuroscience to marketing. This approach helps to find how our nervous system reacts to a variety of triggers that we have in our environment. The field has had multiple breakthroughs over the past few years, eventually leading to more frequent use.

Meanwhile, businesses develop and find new ways of advertising, the damaging impact on the environment of the production has been overlooked and ignored. The Sustainable Development Goals report of 2022 highlighted that the population is at the point of worldwide catastrophes if sustainable behaviour is not improved.

The main aim of this thesis is to find the best neuromarketing technics that can be used by sustainable companies and sustainable products in order to increase the conscious buying habits of potential customers. The problem questions rely on understanding the current worldwide environmental challenges situation and finding how neuromarketing can be applied to sustainability. The conducted questionnaire proved that neuromarketing technics are practical. In addition, the research aims to find the most suitable neuromarketing technics for environmentally friendly companies and, in the end, generate recommendations for sustainable businesses. In order to comply with the objectives, a development case was based on Sedas Plantekøkken Aps, a Danish food start-up that produces vegan hummus and nut butter spreads with sustainability at its core of the production. The experiment made in collaboration between the researcher and the case company showed that neuromarketing technics positively affect sales improvement.

The thesis is structured into five main chapters: (1) Introduction, referring to the idea, keywords, challenges, and research methods; (2) Literature review of the environmental situation; (3) Literature review of neuromarketing, its history, technics used (4) Case Study, presenting Sedas Plantekøkken Aps, its current situation, application of neuromarketing, and recommendations for sustainable businesses.; (5) Conclusions, approval of neuromarketing being a reliable tool for sustainable companies in strengthening the competitiveness among other companies.

<sup>1</sup> Keywords: neuromarketing, neuromarketing technics, sustainability, environmental challenges

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## Terms and Abbreviations

<b>SDG</b>	Sustainable Development Goals
<b>UN</b>	United Nations
<b>LIM</b>	Less is more
<b>fMRI</b>	Functional Magnetic Resonance Imaging
<b>EEG</b>	Electroencephalogram
<b>EEA</b>	European Environmental Agency

# 1 INTRODUCTION

In the introduction of the thesis work, the researcher discusses the chosen topic – The use of Neuromarketing technics for improving sustainable choices. The importance of the research, its purpose, and its research questions are presented. It is followed and closed by explaining the research methods used during the thesis work.

## 1.1 Importance of the research

The environmental challenges and their impacts on the world and humankind have been standing for less than three decades. However, the further civilization development goes, the harder it becomes to fight against the environmental problem touching every person on Earth.

During the press conference of the United Nations on 14 September 2022, the Secretary-General, António Guterres, claimed:

I have just returned from Pakistan, where I looked through a window into future. Devastating loss of life, enormous human suffering, and massive damage to infrastructure of livelihoods.

To achieve the goals approved by the UN organization, businesses must follow the rules of SDG. However, no matter how harmful the production process of some businesses is, sustainable enterprises still need a special competitive advantage over other businesses.

Considering the environmental situation and weak competitiveness of sustainable organizations, this research will look at the human reaction to marketing triggers from the perspective of neuromarketing.

From the facts mentioned, the primary research paper's objective is to find out how sustainable businesses can strengthen their position in the market and reach more customers.

## 1.2 Purpose of the research

The purposes of the research were:

- to assess the worldwide environmental challenges situation in 2022

- to analyze the benefits of plant-based eating on the environment in 2022
- to analyze neuromarketing technics most suitable for sustainable business
- to assess the sales improvement or decrease after the implementation of neuromarketing technics
- to generate recommendations for sustainable businesses based on the results from the conducted experiment.

### **1.3 Research questions**

To achieve the objectives of the thesis, the researcher must answer these questions:

- How do businesses influence the environmental situation?
- How does plant-based eating benefit sustainability?
- What neuromarketing discoveries and principles Sedas Plantekokken company can adjust?

### **1.4 Research methods**

Due to the complex characteristics of the subject investigated, the researcher decided to apply three research methods: literature review, questionnaire, and experiment.

Each research method represents a stage in the thesis process.

The preparatory stage was directed by a literature review of three key topics of this thesis: environment, sustainability, and neuromarketing, and as a consequence, the convergence of all. First, it inspects the environmental challenges the world is facing now and the government's measures toward businesses. Then it looks at neuromarketing as a proactive technic used for efficient advertising. Finally, it closes the chapter with its possible use for sustainable enterprises.

The following stage is exploratory, using a quantitative research method – a questionnaire. The mission of the questionnaire is to understand the current level of acknowledgement by the population of our planet of the current environmental situation, the interest in sustainability, possible challenges of sustainable products in the market from the customers' point of

view, their reactions to some neuromarketing technics and thoughts about the future of sustainability.

Last but not least is applying obtained information to the case study by experimenting. The experiment analyses the efficiency of neuromarketing technics applied by sustainable businesses. The research method is concentrated on obtaining quantitative data, which can approve the success or the failure of the major research paper's aim.

## 2 ENVIRONMENTAL SITUATION

This chapter presents the first part of the academic literature review stage. It includes information from scientific journals, articles, and as well statistics. This research method allows diving deeper into the topic of the environmental situation and all the aspects included in it. All the gathered information will be used to achieve one of the objectives of this thesis – assessing the environmental situation of 2022.

Since the topic has extensive data to present, it was decided to divide the chapter into three subtopics:

- Current environmental situation
- Undertaken action for improvement
- Specific regulations applied to companies

The primary idea of this part is to provide the reader with all the needed information on the environmental situation, create a full recognition of its challenges, and show the limitations put on companies for achieving a long-term goal.

### 2.1 Current situation

The latest UN press conference, led by Secretary-General, António Guterres, took its place on the 14th of September this year (2022). The UN leader's opening words about the world's environmental situation have been setting the starting point of the meeting. The problems the world is facing now can be summed up in one sentence of his:

Unless action is taken now, unless funds are distributed now, these tragedies [floods, droughts, fires] will simply multiply, with devastating consequences for years to come, including instability and mass migration around the world.

In 2020 a new survey on environmental challenges was conducted by Ipsos. People from all over the world could share their thoughts on the significant issues faced by our planet.

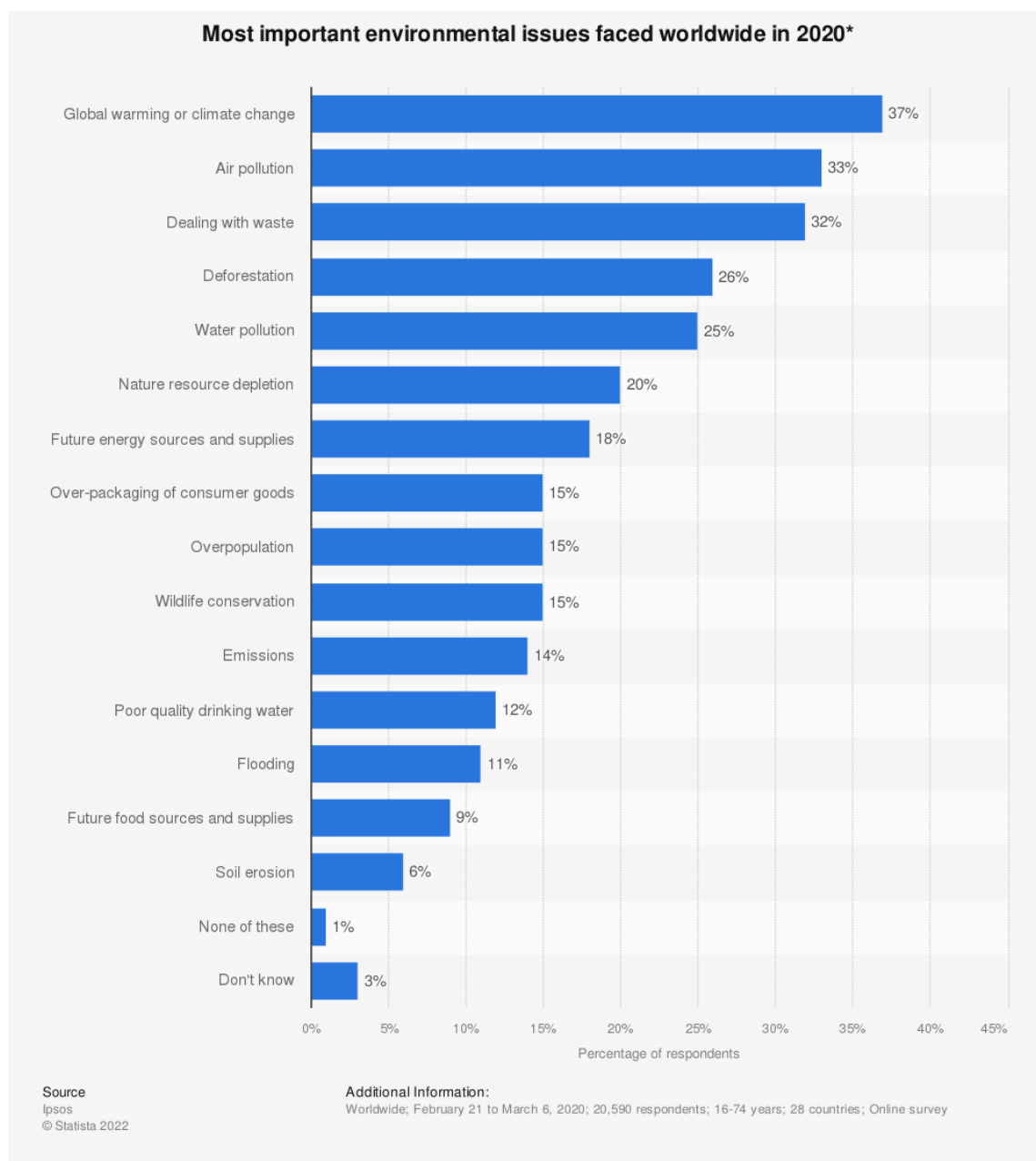


Figure 1. Most environmental issues faced worldwide in 2020 (Statista, 2022)

According to the poll (see Figure 1), the top five most critical environmental problems are global warming or climate change, air pollution, dealing with waste, deforestation, and water pollution (Statista, 2022).

The first reports on the environmental situation were created by EEA (European Environmental Agency) in 1995 (EEA, 2019). However, the beginning of the recognition concerning this topic dates back to 1972 (see Figure 2).



As seen on the map of the history of Environmental challenges development (see Figure 2), since 1972, there have been many milestones set. The timeline shows that the first 40 years of the process have been spent on generating data about environmental problems. Later on, the perspective was built for a brighter future. Furthermore, only in the period between 2013-2015 the first actions have been made.

September 2015 has become a month of approval of 17 sustainable goals set for Europe (see Figure 3) (UN, 2022). Sustainable goals are aimed at the environmental problems of our planet and the socio-economic factors of our life.

Later that year, in December, the Paris Agreement on Climate Change was approved.



Figure 3. 17 Sustainable Development Goals (UN, 2022)

This report will look at the current situation of environmental factors, which are listed under numbers 12, 13, 14, and 15 in the Sustainable goals table (see Figure 3).

Goal 12 represents the need for responsible consumption and production. The objectives of this goal must achieve the creation of sustainable production at all stages, minimize food waste, and manage toxic chemicals' release into the environment. It also encourages the

public and companies to change to sustainable production and distribution and develop technologies that must help manage and supervise sustainable goals' processes.

Goal 13 is aimed at a fight against climate change, which stands as the most dangerous environmental problem of all. Action must be taken by 2030, including integrating climate change policies into governmental and societal organizations and providing a budget of \$100 billion annually invested into the Green Climate Fund. Lastly, developing unique technologies that would more effectively impact the change with Climate Combat.

Goal 14 is concentrated on underwater life, which is closely connected to water pollution. There are aims set for 2020, 2025, and 2030. Two thousand twenty goals are directed at reducing marine pollution and managing ecosystems. It includes problems like overfishing, acidification of the ocean, and management of marine-based plants. While 2020 was mainly aimed at reducing possible impacts, 2025 is encouraged to be the year of prevention of any pollutions marine environment meets. Eventually, 2030 must be the year of protection of Sustainable results achieved and investment into further development of marine sustainability.

Lastly, goal 15 is concentrated on the preservation of life on land. Its actions by 2030 are aimed at combatting deforestation, and desertification, preventing ecosystem pollution, an investment in reverting the loss of forests, and saving land species (UN, 2015).

According to the European Environmental Agency report (2019) the reason for such a drastic impact on nature dates back to the 1950s. During that period, the population has already increased by three times, urban population increased by four times, leading to increased economic spending. The more people there were to take care of, the more resources needed to be used.

Unfortunately, even though actions have been made to support the planet's population, they caused high-scale socio-economic and environmental problems (Ajibade et al., 2021). More than that, the human polluting actions, influencing our environment, are backfiring the quality of life of Earth's population. It includes a variety of diseases, like headaches, vomiting, cancer of multiple organs in the human body (Rana et al., 2017; Dada et al., 2016), and psychological damage (Ajibade et al., 2021, according to Brazilian Association of Technical Standards, 2019).

This report will discuss in depth the environmental problems that have been directly impacted by humankind. In this category fall: climate change, water pollution, air pollution, soil pollution, and food waste.

### **2.1.1 Climate change**

Climate change has been one of the most dangerous consequences of men's activity on Earth.

According to the UN report (2022), it was found that the situation of greenhouse gas emissions has worsened, creating a new record reach of emissions release. As a visible consequence of such a disaster, 2021 became the warmest time in the past seven years.

Even though the COVID-19 pandemic resulted in a drop in the current emissions level, the recovery period following the worldwide disease pressured society to use more fossil fuels (oil, coal, and natural gas). The European Environmental Agency (2019) states that the aim of a decrease in the planet's temperature set for 2030 will not be achieved.

Unfortunately, such regress and unwillingness to participate in change will have substantial consequences. Environmental catastrophes, like drought, floods, and heat waves, will become more frequent. By 2100 the sea level can rise by half, even if the goal of lowering the temperature to 2 degrees Celsius is met. Almost 90% of coral reefs will vanish despite the probability of lowering Earth's temperature to 1,5 degrees Celsius. In addition, to ocean-related consequences, the population of 3 billion will suffer from hunger and disease. The food system and ecosystems will be compromised. In 2030 almost 700 million people will suffer from drought, poverty, and lack of humanitarian help (UN, 2022).

### **2.1.2 Water pollution**

Water pollution is one more environmental problem caused directly by humankind. It is influenced by the concentration of a significant amount of people in small areas, the industrialization of our society, and following activities, like mining, chemical over usage, and ignorance of environmental damages led by poor management of previously mentioned activities (Ajibade et al., 2021, according to Afroza et al., 2015; Jeevanantham et al., 2019).

Water is a natural resource needed for sustaining the life of the Earth's population, biodiversity, and environment (Ajibade et al., 2021).

The pollutants influencing water can be divided into heavy metals and organic pollutants (Ajibade et al., 2021). Heavy metals influence people and animals through breathing, food intake, and drinking already-intoxicating water (Popa & Petrus, 2017). Organic pollutants usually are hidden in medications, personal care products, paints or hair colours, and the leftover waste from the products themselves (Ajibade et al., 2021, according to Kar & Roy, 2010; Aguirre-Martínez et al., 2016). The consequences of water pollutants can influence on the health of human population, environment, and economy.

Currently, the UN (2022) is facing a problem of not reaching the 2030 goal in water sanitation, which will leave 1.6 billion people in survival without fresh water. Moreover, the water biodiversity is rapidly dying. Already now, the acidity of the ocean, created through the absorption of carbon dioxide, elevated. It led to the death of 14% of coral reefs and kept influencing the water environment (EEA, 2020). In addition, the plastic in the ocean is predicted to increase by 2 or 3 times by 2040. However, the plastic on the ocean's surface is not even the worst problem. The moment plastic starts degrading and diving into micro and nano plastics, it becomes harder to be cleaned. Moreover, the accumulation of smaller plastic pieces at the bottom of the ocean will influence the nutritional chains of the marine environment, the CO<sub>2</sub> cycling process, which influences oxygen levels in the sea, and soil degradation (MacLeod et al., 2021).

### **2.1.3 Air pollution**

Air pollution is closely connected to the energy sector. Fossil fuels, chemicals, and other toxic substances are thrown into the atmosphere and strongly influence the atmosphere (OECD, 2016). Among the primary sources of air pollution are transportation sources (all types of vehicles: cars, trucks, ships, planes, trains) and stationary sources (industrial plants and all the waste from them) (OECD, 2016; Ajibade et al., 2021).

There are six primary air pollutants: sulfur dioxide, nitrogen oxides, particulate matter, carbon monoxide, volatile organic compounds, and ammonia (Khan & Ghouri, 2011, according to European Public Health Alliance, 2009). Depending on the concentration of each pollutant in the atmosphere, a variety of damaging effects can occur (OECD, 2016). For example, the

consequences of air pollution include a shorter life expectancy of the urban population, decreased agricultural harvest, the appearance of acid rains, and pollution of water sources like lakes, ponds, and rivers (OECD, 2016; Khan & Ghouri, 2011).

Environmental European Agency (2019) claims that the decrease in air pollutants has been on track with 2020 targets. However, despite the overall decline in emissions showing promising results, the percentage correlation between different chemicals has yet to be proportionally equal. As an example, sulfur dioxide emissions went down by 62%. Meanwhile, ammonia emissions declined only by 4%. Ammonia decline progress is 15,5 times lower than sulfur dioxide (EEA, 2019).

Unfortunately, even though the goals of 2020 have been met, the goals of 2030 in correlation with air pollution stay questionable (EEA, 2019).

#### **2.1.4 Soil pollution**

Soil pollution has been a part of environmental discussions by various researchers because of its vital role in human life and the ecosystems of all nature.

The discussion about soil pollution usually discusses the toxic chemical that enters the Earth's layers due to various human activities (Al-Taai, 2021). There are five familiar sources of soil pollution: radioactive chemicals, industrial waste, natural phenomena, mining, and soil depletion (Al-Taai, 2021).

In addition to the most common sources of soil pollution discussed previously, pesticides heavily impact the agricultural sector. It is considered that 74.8% of the land is at the edge of pesticide pollution, and 31.4% is already in the emergency category (Tang et al., 2021). Even though pesticides were used to improve the harvest quantity, it has the reverse effect on the environment. Many beneficial insects and bacteria are being killed together with harmful ones and other animals and insects, like bees, fish, and birds (Al-Taai, 2021). Environmental European Agency (2020) shows that around 70,000 chemicals in the market have poor quality and characteristics that can damage the environment and people. Among the most influenced areas of soil pollution are Bulgaria, Slovak Republic, Poland, and Ukraine. In addition, to these countries, South Africa, China, India, Australia, and Argentina are considered to be in danger of impactful pesticide pollution (Tang et al., 2021; Khan & Ghouri, 2011).

Chemical pollution is mainly a reason for soil pollution. However, its reverse results still need to meet the goal put for 2030 for now (EEA, 2019).

### 2.1.5 Food waste

Food waste is a complex problem our society is facing now. It does not only represent the disposal of unused products, but as well presents issues with packaging deterioration, social impact on purchase decision-making, and hunger (UN, 2022; Alexander et al., 2013; Aschemann-Witzel et al., 2015; Dilkes-Hoffman et al., 2018; Berge et al., 2015).

UN report (2022) indicated that around 828 million people suffered from hunger in 2021.

Papargyropoulou et al. (2014, according to Stuart, 2009) claimed that between 30 to 50% of North America's and Europe's food waste combined could help the starving population of our planet. More than that, it could provide people who suffer from hunger with necessary food supplies over three times per person.

The responsibility for food waste has been divided into two sources: industrial and individual. The industrial stage includes agriculture, food processing and packaging, and distribution. Meanwhile, individual responsibility represents the consumption stage (Papargyropoulou, 2014).

It has been discovered that companies, to save the brand's face and reputation, tend to put all the responsibility on consumers' shoulders (Alexander et al., 2013). The responsibility level depends on the country the food is distributed in. When we talk about low-income countries, food management depends on the country's limited monetary and technical abilities, which later on influence every stage of the food production process and its distribution action (Giroto et al., 2015). At the same time, the countries that have more considerable funds cause food waste due to managerial problems and consumer behaviour (Giroto et al., 2015).

Among the most common reasons for consumers' food waste is dissatisfaction with the product's taste or the triggering behaviour after surpassing the end date (Aschemann-Witzel et al., 2015). However, the industrial process has more stages and, therefore, more reasons for disposal. For example, the harvesting stage loses some yield while using poor techniques, leading to fewer crops. It can also be affected by the poor timing of harvest or

influence from the land species, like birds. Later on, the transportation of harvest can cause damage to collected foods, which leads to their disposal. Finally, the poor management of storing and processing stages can infect foods with different chemicals or diseases, which makes them unusable (Papargyropoulou et al., 2014).

Food waste significantly impacts the environment at the stage of its disposal. During the natural degradation process, such elements as methane and carbon are released. Their high concentration in one area can influence climate change (Papargyropoulou et al., 2014). Previously it was already mentioned that climate change is currently in a “red zone” among all environmental disasters (Section 2.1.1: Climate change). Therefore, this problem becomes one of the most important to resolve.

## **2.2 Plant-based diet influence on the environment**

Previous sub-chapters explained the human’s heavy impact on the environment. Climate change, water, land, air pollution, and food waste influence our planet and, eventually, the whole population of it. However, there is an opportunity to make a difference by changing the already-built behaviour.

One of the possible solutions that can make a difference in the environmental situation of the planet is switching to plant-based eating. The study conducted by Rosi et al. (2017) used LCA (life cycle assessment) methodology to find the level of environmental impacts of 3 groups which follow different diets. They include omnivorous (eating plant-based and meat products), vegan (only plant-based eaters), and vegetarian (excludes the meat out of the ration). The results showed that the omnivorous diet group had the worst environmental impact by three indicators: the carbon footprint, the water usage impact, and the ecological footprint.

Animal products harm the planet due to food production and agriculture. According to Poore and Nemecek (2018) (see Figure 4), food production is responsible for 26 % of global greenhouse emissions. 51 million km<sup>2</sup> of land, which is half of the world’s territory, is exploited by agriculture. 70 % of fresh water is used for agricultural activities. They are as well responsible for 78% of ocean and water eutrophication. Eventually, 94% of mammals and 71% of birds on the planet are grown as livestock.

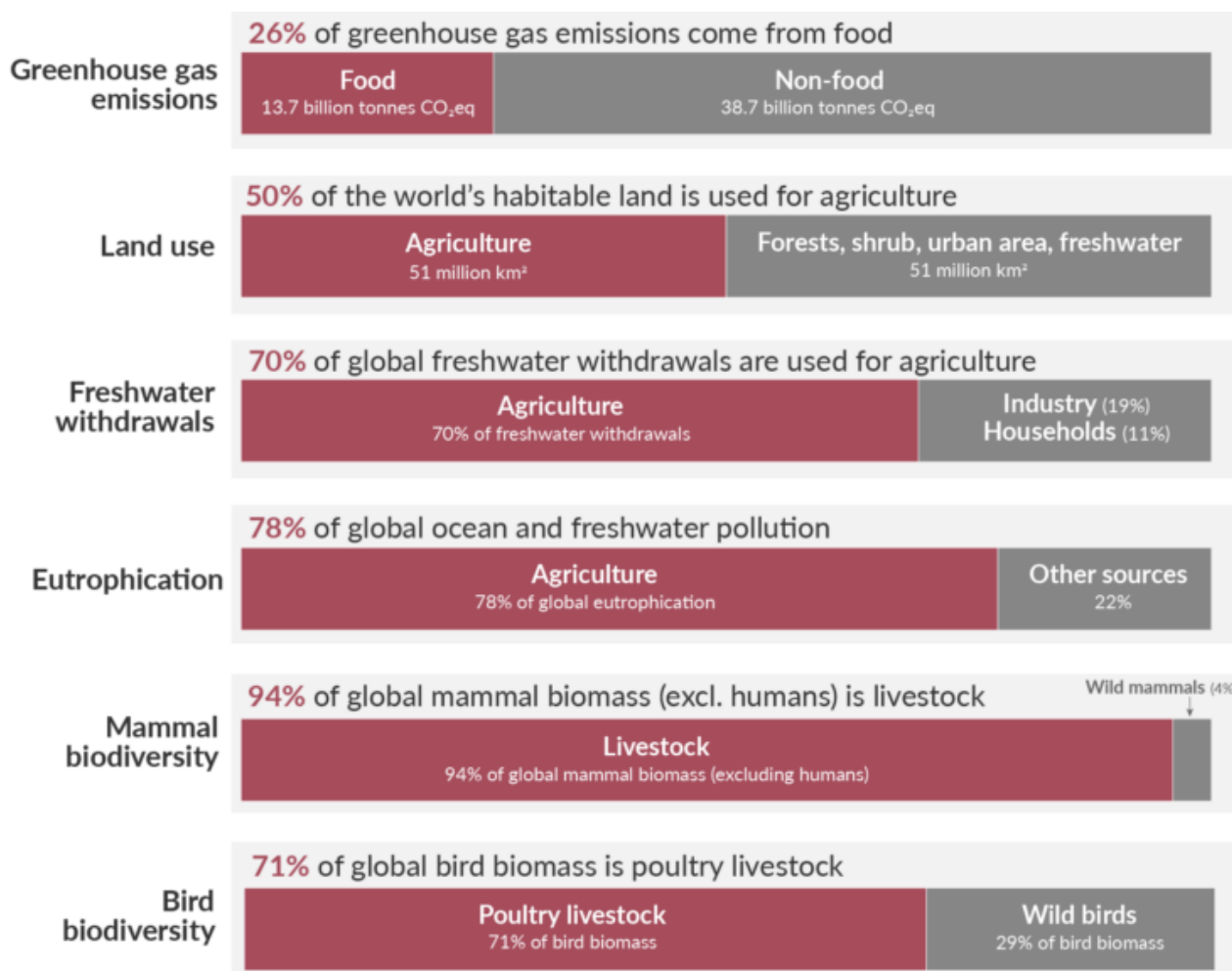


Figure 4. The environmental impacts of food and agriculture (Poore & Nemecek, 2018).

Nevertheless, how does the omnivorous diet influence the environment?

To begin with, the water footprint from producing 1 kg of beef achieves 15,500 litres of water, 1 kg of pork requires 4,800 litres of water, and 1 kg of chicken requires 3,900 litres. Meanwhile, crops like corn only require 900 litres of water (Hoekstra, 2008). Furthermore, the UNESCO report showed that one individual's vegetarian diet reduces the water footprint by more than half (58%) (Mekkonen & Hoekstra, 2010).

Regarding air footprint, the three leading greenhouse emission gases released into the atmosphere are carbon dioxide, methane, and nitrous oxide (USEPA, 2022a). Methane is directly linked to livestock production since it is produced from the digestive end-up of animals. The USEPA (2022b) found that enteric fermentation equals 27% of all American methane emissions. Poore and Nemecek (2018) researched carbon dioxide emissions. It was found that 100g of protein production from meat needs 105kg of carbon dioxide to be emitted into the air. In contrast, 100g of protein-produced beans releases only 0,3kg of carbon dioxide

into the atmosphere. Therefore, it led to the conclusion that plant-based eating cuts around 73% of emissions into the air, varying on the location of residence.

Moreover last but not least is the problem of land exploitation for livestock production. The plant-based diet cuts down the need for land by 30-35% (Poore & Nemecek, 2018). Therefore, to grow the livestock, there is a need for nourishing land to provide enough harvest for livestock feeding. Furthermore, reducing livestock quantity can lead to lesser use of fertilizers and reduced emissions (Eshel et al., 2019).

All in all, a plant-based diet has a positive impact on the environment. It cuts down the greenhouse effect, water usage, and land exploitation, enabling the United Nations to achieve sustainable goals faster.

### **2.3 Undertaken action for improvement**

Previously in chapter 1: Environmental situation, the researcher discussed the current environmental pollution our world is meeting and explained the concept of sustainable goals. However, more than the progress made in the environmental situation, improvement is needed to reach the 2030 goals. The literature research conducted by the writer showed that Sustainable Development Goals are not binding people legally towards the change of behaviour (UN, n.d.). Among numerous policies, only a few have a binding character that allows the tracking and implementation of SDG goals to be more visible.

All the information about implemented policies is taken from the official report of the UN organization (EEA, 2019).

When it comes to the protection of biodiversity and nature, the Environmental European Agency (2019) counted ten policies that are currently or were in action. 9 out of 10 policies are aimed at the year 2020. Only one has a long-term that is meant to be achieved by 2050. 2 out of 10 policies have a legally binding character: Regulation on Invasive Alien Species (EU Regulation 1143/2014) and Birds Directive (Directive 2009/147/EC) together with Habitat Directive (Council Directive 92/43/EEC). The main targets of these policies are to prevent accidental or intentional implementation of unusual species to the environment, which might lead to negative consequences, and preserve the endangered species of birds, animals, and plants from extinction accordingly. Talking about non-binding commitments, they represent

the separation of the main aim of preserving and restoring biodiversity and ecosystems. Among those smaller targets are creating more sustainable fishing policies, improving pollinator reduction, and implementing Green Infrastructure into the policy system.

Regarding land and soil pollution policies, only 1 out of 7 of them holds the binding character – LULUCF (Land-Use, Land-Use Change and Forestry) (UNCC, n.d.). This binding legislative proposal is closely connected to air pollution reduction as well. The policy is aimed at the reduction of greenhouse emissions that appear from the exploitation of land and forest. The LULUCF targets are also part of the Paris Agreement protocol, which fights against climate change. However, the EU Roadmap to a Resource Efficient Europe (COM(2011)571) does not have a legally binding character, but it is worth mentioning to its target. The policy is fully concentrated on the soil problems of our planet. It includes soil erosion and its depletion. The roadmap is targeting reviving soil areas that became infertile and clean chemically influenced lands.

Regarding air pollution, such policies as NEC (National Emission reduction Commitments) Directive (2016/2284/EU), CLRTAP (Convention on Long-Range Transboundary Air Pollution), and Ambient Air Quality Directive (Directive 2008/50/EC) are taken into action. NEC Directive targets the reduction of primary air pollutants that have a tremendous environmental impact. The pollutants include nitrogen oxides, non-methane volatile organic compounds, sulfur dioxide, ammonia, and delicate particulate matter. In addition, the other two policies aim to reduce concentrated air pollutants and, as a final goal, its prevention from usage.

Furthermore, climate change remains the most dangerous problem humankind fights now. As mentioned, the Paris Agreement was approved in December 2015 and remained one of the most important documents on this issue. It is binding the European Union countries to spend 100 billion dollars annually on developing strategies and implementing actions concerning global warming.

Moreover, eventually, we approached policies against water pollution. Surprisingly, it is the sphere with the majority of agreements legally mandated to be followed. Two agreements, Council Directive 92/43/EEC and Directive 2008/56/EC, aimed at preserving and restoring natural marine habitats and the biodiversity of underwater life. However, their implementation of actions has been limited with the 2020 year. In addition, multiple agreements are directly

aimed at the chemical and litter pollution of water. The list consists of Directive 2000/60/EC, Directive 2008/56/EC, and EU biodiversity strategy to 2020 (EC, 2011).

Their objectives were set for 2020 and include:

- targets like reduction of emission discharge in the marine environment,
- monitoring the levels of contamination of water and making sure there is no rise in its concentration,
- disposing of the litter from the marine environment to the point of no harm, and
- prohibiting human-sourced contamination of the water environment.

All the mentioned agreements have been legally mandatory for the EU countries to follow. Such a character of policies can ensure that change will happen since there is no way to escape its execution.

## **2.4 Specific regulations to companies**

In section 2.1 of this report, we found that sustainable goals are optional for implementation. More likely, they have a strongly advisable character of execution. Nevertheless, we found that there is a variety of policies that limit the actions of countries regarding different pollution. However, legal limitations should be visible when we start talking about businesses.

The adoption of SDG has encouraged a business initiative in solving environmental problems. However, United Nations Global Compact (UNGC) is a non-binding policy that encourages and helps businesses of different sizes, locations, and inner structures to implement Sustainable Development Goals into their action plan and report on further achievements (UNGC, 2022).

In order to find possible drivers of sustainable practices implementation, Rosati and Faria (2019) came up with several hypotheses that later on have been evaluated. They found that large companies are more inclined to report their success in SDG-related actions. In addition, companies are more interested in sustainable reporting when the country and sector they operate in have more favourable circumstances. In the company's composition, it is more likely to have a sustainability inclination with female directors on the board. As well as females, the

younger generation is an enthusiastic team for addressing the achievement of sustainable goals.

Unfortunately, companies' initiative in implementing sustainable goals is not the only part that matters. The integration of SDGs is closely connected to the location of businesses. For example, China can be seen as a fertile environment for adopting sustainable goals. The main reason is that the country has old norms that have existed in the culture for many generations (Yu et al., 2020). The research of Yu et al. (2020) showed that more than half of participating companies aligned their business direction with sustainable development goals.

Moreover, other research touched on Asian countries' sustainability reporting (Pillai et al., 2017). The companies participating in the survey were from 5 countries: Australia, Malaysia, Qatar, Thailand, and UAE. Australia was shown to be the leader in sustainability reporting compared to other participants. Moreover, Global Reporting Initiative (GRI) has been chosen as the indicator for comparison.

On the other hand, there are countries experiencing trouble with SDGs implementation (Salvia et al., 2019). For instance, North Africa struggled to improve its agricultural state and water management. At the same time, North America cannot have an input in solving the climate change problem and experiencing troubles preserving ecosystems. As well, countries from Oceania were moving further away from goals like cutting carbon dioxide emissions and restoring forests and the agricultural sector. In contrast with previously mentioned countries, Europe achieved progress in most sustainability sectors. It improved waste generation and toxic emissions release and incorporated renewable energy technologies.

Overall, companies depend not only on their initiative in implementing Sustainable Development Goals but also on countries' situation in general.

### 3 NEUROMARKETING

In the chapter, the reader will learn about the roots of neuromarketing, the most common tools used for its experiments, and discoveries of the past two decades concerning this field.

In addition to the topics mentioned above, it will discuss the limitations of the Neuromarketing field that will be presented together with contrary counterarguments to them.

#### 3.1 History of Neuromarketing

Neuromarketing history began in the late 1990s when Gerald Zaltman, an American Harvard Business School marketing professor, decided to research unconscious triggers influencing our behaviour. This study became the starting point of Neuromarketing development.

Even though the first study on neuromarketing was conducted in the 1990s, the first mention of this term was in 2002 by Dutch marketing professor Ale Smidts.

"Neuromarketing" term became the definition of a multidisciplinary marketing field that uses psychology, sociology, and neurology to the explanation of human behaviour (Stasi et al., 2018).

There is a common misconception made with the "neuromarketing" term. It is essential to understand that "Neuro" is not ending in brain activity, but "Neuro" equals the reaction of the brain, nerves, and the whole nervous system to the environmental triggers, surrounding us.

The new marketing field gained recognition after Pepsi and Coca-Cola's experiment in 2003 (McClure et al., 2004). The experiment aimed to determine why people chose one beverage or another despite the common chemical ingredients used to produce both drinks. The results of the blind-tasting experiment showed that participants actually showed more preference for Pepsi production and not Coca-Cola, as was claimed before. Eventually, it was found that branding plays a strong role, and in case of Coca-Cola, it was stronger. (McClure et al., 2004).

Such a controversial result raised interest among research companies and pushed the exploration of this topic to another level.

However, with growing interest, several discussions appeared on whether neuromarketing is a fair approach to advertising products. (Stanton et al., 2017). Among those discussions, the topics like unethical influence on the subconscious level, untrustworthy information, bad quality check, transparency problems, and unfairly gained advantage by salespeople have been discussed as significant reasons for not using neuromarketing technics and experimental results (Stanton et al., 2017).

Nevertheless, neuromarketing still stays one of the most effective approaches towards marketing the product, which makes it a highly-investing area for research.

According to Arndt Traindl (2007), the general director of Retail Branding AC company, nowadays, the market is experiencing a crash due to seeing customers as people without emotions and only willing to buy.

In this case, emotions are represented as something impulsive and not belonging to a reasonable person. However, the discrimination of emotional aspects of human beings can put the market on the path of never being able to thrive again.

The book of Arndt Traindl (2007), "Neuromarketing: Visualizing Emotions", states:

Not the pricing policy, but the nature of emotions – is something that will breathe life into dying markets.

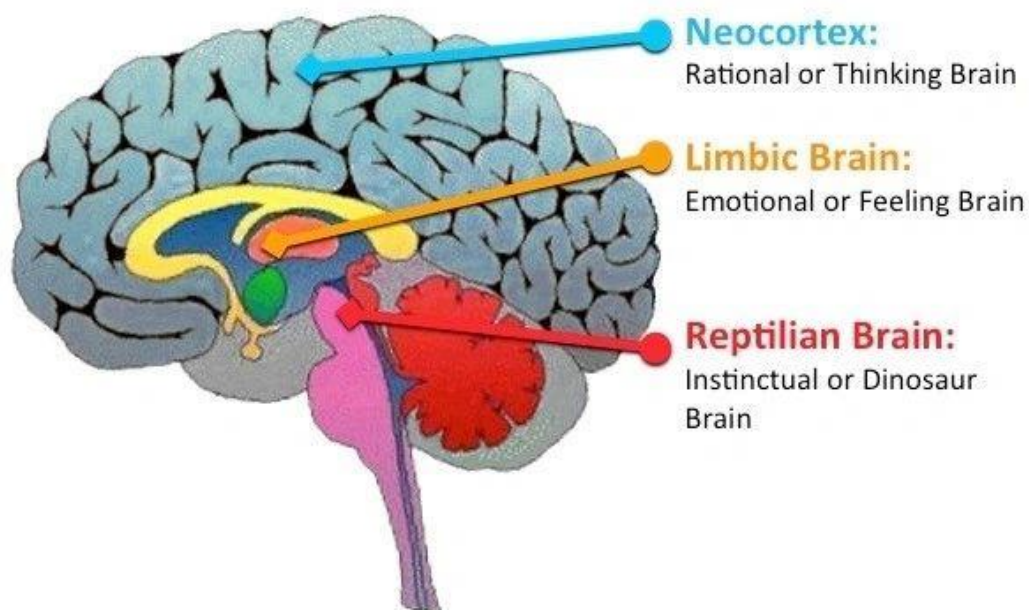
### **3.2 Neuromarketing Tools**

Neuromarketing has various tools used to explain a person's behaviour. The most common ones are fMRI, EEG (Electroencephalogram), and Eye-tracking.

However, it is vital to understand how and in which parts of our brain emotions appear.

All of our reactions, thoughts, and feelings go through the brain. It takes 200 to 500 milliseconds for the signal to come from one part of the body to the brain. It can be a reaction to the photo, sound, pressure, or scent (Traindl, 2007).

From the anatomical perspective, emotions appear in the limbic part of the brain (see Picture 1). This is the crucial part of the brain in neuromarketing, since the effectiveness of the field depends on people's emotions.



Picture 1. Structure of brain (Luisetto et al., 2018)

Limbic brain consists of the nucleus accumbens, which is responsible for desire, Insula – responsible for pain, and Amygdala, the oldest brain part, is responsible for our fear.

In the end, neuromarketing tools help to analyze the appearance of emotions. They help to understand when, under what circumstances, and why the emotions appear. Further on, the reader will learn more about these tools.

### 3.2.1 fMRI: Functional Magnetic Resonance Imaging

The first neuroimaging tool is fMRI. Paul Lauterbur and Peter Mansfield in the 1970s have created it.

The abbreviation can be decrypted as functional magnetic resonance imaging. However, it tells nothing to the person without a proper explanation of what it does.

fMRI can embed the changes in the blood flow during brain activity. Doctors usually use this technology to examine the brain's functional anatomy, see which main brain functions like thought, speech, movement, and sensation are held, and assess trauma or any abnormal growth in the brain.

fMRI has multiple advantages compared to other imaging technologies, like computerized tomography (CT).

Among those advantages are the following:

- Noninvasive nature of the technology
- The fMRI has created a way to use strong magnetic fields to picture the signal from the body. Compared to CT, it uses less energy to get the signal, making the whole procedure less stressful for the body.
- It is fast and informative. fMRI can provide the doctor or a researcher with a variety of information on brain structure in 4-5 minutes and function in 4-8 minutes (Dick et al., 2014).



Picture 2. An example of fMRI scanner (Abraham, 2018)

Picture 2 shows an example of an fMRI machine used for research at Dartmouth College. This technology has a strong magnetic field and uses additional magnetic gradient coils to capture signals. In order to make an image, an fMRI machine can change the frequencies created by magnetic fields and coils, which leads to multiple variants of magnetic gradient, and creates a sample of signals. Later on, the signals are decoded and created into images.

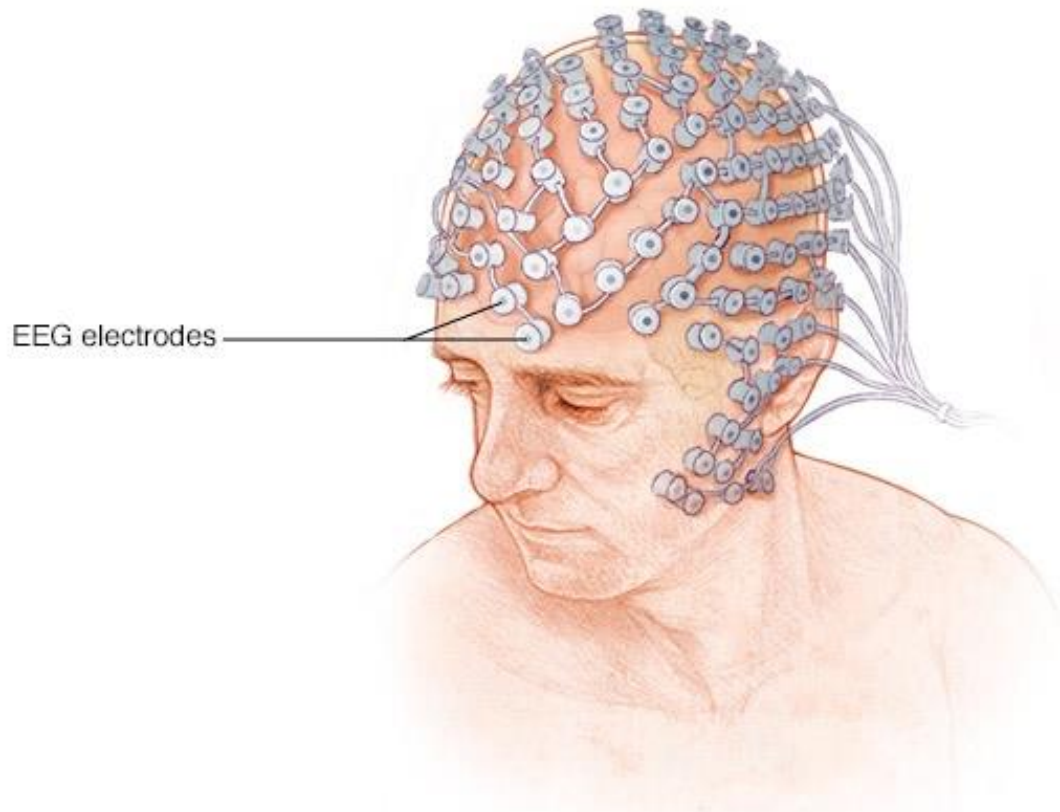
### **3.2.2 EEG: Electroencephalogram**

The first discoveries of electrical activity in the brain were made in 1875. Since then, it has been investigated by scientists from all over the world. England, Ukraine, Poland, and Germany were taking part in expanding discoveries in that sphere. It led to the first recording of the human EEG in 1924 by Hans Berger, a German psychiatrist, and later on the creation of the developed EEG device for mapping brain activity.

How does EEG work?

The communication between the parts of our brain is happening thanks to the electroactivity inside it. When electrochemical signals sent between brain cells are getting into large groups,

they create impulses that eventually can be monitored by the EEG machine.



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Picture 3. Example of an EEG tool (Mayo Clinic, 2022)

Picture 3 shows an example of an EEG tool used by the Mayo Clinic. The EEG electrodes that can be seen in the picture are metal sensors placed all over the scalp. They can record and analyze changes in voltages that electrodes receive from the brain during a specific time cycle. (Dick et al., 2014).

In the medical field, EEG is used to find abnormal activities of the brain, like brain disorders. The tool can also recognize brain damage, brain dysfunctions, tumours, disorders, or inflammations.

### 3.2.3 Eye-tracking

Eye-tracking is one more tool used for studies of neuromarketing.

In the name of the approach, it is already possible to understand what the technology does. Eye-tracking tools are used for recording eye movement on a limited surface. It considers such parameters as pupil position, the gaze vector of each eye, and the gaze point.

The technologies used for eye-tracking usually consist of small cameras and light sources that help decode information received from the experiment later.



Picture 4. An example of eye-tracking system of The EyeTribe company (Kaheh et al., 2021)

Picture 4 represents one of the examples of eye-tracking tools from The Eye Tribe company used for the experiment. The research aimed to determine how the product's brand and price influence the subject's preference compared to another similar-looking product.

Participants went through 3 rounds, where they have presented with two pictures of shoes. In the first round, there were just photos of shoes. The second one presented shoes with their brand name. And in the last round, shoes were shown with the brand name and price.

At the end of the experiment, results showed that despite participants' choice to buy cheaper shoes, their desire was aimed at a more expensive pair. The eye-tracking system approved it since the participants spent more time looking at the more expensive pair. Therefore, buyers' preferences change when they are introduced to the brand name and the cost of the product (Kaheh et al., 2021).

### 3.3 Neuromarketing technics

Previously, the reader could learn about neuromarketing history and the most popular devices used for conducting experiments on this topic.

In this subchapter, the reader will be presented with examples of experiments made using previously discussed tools and methodologies that have been born as general principles used in marketing. Among those principles are Less is More (LIM), Sensory marketing, Psychology of free, Ownership, Social Influence, and Expectations. All of them will be discussed in detail.

#### 3.3.1 Less is more (LIM)

As stated in the subheading LIM, the concept "Less is more" was first captured as a phrase in the poem of Robert Browning, Andrea del Sarto, in 1855. The poet was expressing his feelings about his art being judged:

“Yet do much less, so much less, Someone says,

(I know his name, no matter)—so much less!

Well, less is more, Lucrezia: I am judged”

Later on, the expression Less is more became a concept in marketing. The idea that stands behind this concept is – that the fewer products are presented, the higher their quality is, and the stronger the willingness grows to buy the product (Traindl, 2007).

According to Arndt Traindl (2007), LIM was approved as a working scheme through empirical research in 1999. In the experiment, 300 people were asked to choose the most favourable product presentation for buying. The first option represented the ordinary presentation of the product, and the second represented the stand built by the canvas of the LIM concept. The results showed customers inclined towards the second option in the percentage proportion of 20 to 80.

Chernev et al. (2015) write about choice overload, its benefits and drawbacks, and features that influence positively or negatively customers' perception of a wide variety of products.

Based on the findings from experiments of previous years, it has been conducted that the fewer products presented to the customer, the more likely the purchase is (Chernev et al., 2015). From the neuromarketing perspective, the emotions that arise during choice overload are essential to mention. Chernev et al. (2015, according to Botti & Iyengar, 2004; Haynes, 2009; Inbar et al., 2011) found out that while experiencing choice overload, individuals start feeling unsatisfied, unconfident, and regretful. These feelings influence customers' decision-making and eventually raise the probability of neglecting the choice, exchanging the product, being willing to see more options, or being inclined to approve the choice quickly.

The LIM concept can help with the state customers get into from choice overload. According to Traindl (2007), the experiment conducted in NKD clothes showed that optimizing product presentation could make a good impression on customers and achieve higher sales.

Overall, the LIM concept has become a tool for achieving success in sales and building positive customer experience.

### **3.3.2 Sensory marketing**

Sensory marketing is another concept closely connected to neuromarketing. Krishna (2012) defines it as a type of marketing that uses the human body's five senses (vision, hearing, touch, smell, and taste) and influences the decision-making process.

Many studies have been conducted to prove that a person's behaviour can be changed after influencing at least one of his/her senses. For example, Hsu and Chen (2019) proved that music usage could influence customer purchase decisions. Two factors influencing the buyer have been found: the music frequency and the country's origin.

In the case of taste testing, one of the most famous experiments was conducted with Coca-Cola and Pepsi products (McClure et al., 2004). The experiments showed how strongly the brand image influences the customer.

When it comes to scent, it is considered to have the most influence on emotions (Hirsch, 1995). The strong effect can be explained by the fact that our nose is connected and directed to the olfactory lobe, which is considered the centre of emotions (Hirsch, 1995). Therefore, Mitchel et al. (1995) were interested in showing smell's influence and figuring out what role

the congruent and incongruent scents play. Results of the experiment showed that in the environment congruent with scent, customers' were spending more time checking other products, and the variety-seeking behaviour was raised.

Traindl (2007) found out that the customer can be influenced even by background images and messages. The background can create negative or positive emotions in the buyer, even if the content does not have any logical connection between them. In addition, it was found that the cheerful design of the price can also make a difference in the impression of prices. As a result, even a little smiling emoji made buyers more inclined to buy the product.

Rimkute et al. (2016) explained why so many brands use sensory marketing – it affects decision-making by creating a mental association with the brand and products. As a result, the influence happens on deeper levels and pushes individuals to create a bond between themselves and brands.

Even though sensory marketing has been proven to be a vital tool for advertising, it has been found that awareness of it can turn customers' states into more analytical ones. Bosmans (2006) found that incongruent odours make customers more attentive and analytical about their choice. After recognizing odour influence, participants start seeing smell as a persuasion tool, followed by defensive behaviour (Rimkute et al., 2016).

Eventually, sensory marketing has two sides in its application. It can improve sales and strengthen the bond between customers and the brand, but at the same time should not cross the privacy boundaries. As a result, it is essential to consider both positive and negative influences and learn from previous experiments.

### **3.3.3 Psychology of free**

Zero as a number is used in different concepts. For example, Kahneman and Tversky (2013) connect zero to risk-taking, Shampanier et al. (2007) research the influence on people's behaviour while seeing the price of zero, and Ariely et al. (2018) inspect the influence of social norms on individual behaviour while interacting with zero-priced products.

The findings of Shampanier et al. (2007) approved that people tend to have more inclination toward zero-priced products. They conducted three experiments that all led to the same

conclusion. The first experiment was virtually based, which made the first statement in favour of zero effect. The second experiment was real-time based, which later approved the first finding (in both experiments, conditions were the same). Furthermore, the third one had a slightly different change in circumstances: the researchers tried to determine whether a significantly reduced product price could be seen as more beneficial than a zero-priced product. The result showed that the superiority of a zero effect was kept the same. Three experiments led the researchers to think that people prefer to choose products that do not lead to personal loss. Kahneman and Tversky (2013) named such behaviour a loss aversion effect. In this concept, the pain from loss is seen as more robust than the satisfaction from gain, which further influences the risk-taking decisions of a person.

Finucane et al. (2000) came up with the affect heuristic, which proves that people's choice change due to the introduction to different levels of risks and gains. Therefore, the risk received is low if the presented benefit is high. The same goes for vice versa; if the risk is low, the possibility of getting benefits is high. Both of these situations create a positive perception in the individual's mind. In contrast, when the benefit is presented to be low, it can have high-risk consequences. The opportunity to get benefits is also low when the risk is high. Eventually, the last two scenarios lead to a negative perception of the situation.

All in all, the psychology of free has been proven to be a functional marketing approach for products.

### **3.3.4 Ownership**

One individual's perception of a product being bought and sold leads to different decision-making. Such a switch between the position of buyer and seller has consequences on the product's value perception. Thaler (1980) explained value change as the endowment effect, which makes ownership of an item seen more worthwhile for the seller than for the buyers.

This effect has been tested on coffee mugs (Gobel et al., 2014), candies (Knescht, 1989), football tickets (Carmon & Ariely, 2000), and toy buildings (Marsh et al., 2018). Sellers' and buyers' behaviour can be linked to the loss aversion effect when the pain from loss exceeds the pleasure from gaining something (Kahneman & Tversky, 1979). In the case of sellers, the loss comes from forgone experience they connect to the item; meanwhile, buyers are taking the monetary spending as their perspective of pain (Carmon & Ariely, 2000).

However, the perception of loss depends not only on the buyer and seller's position but also on cultural differences and self-characteristics (Maddux et al., 2010; Gobel et al., 2014). For example, it was found that for Asian people, the endowment effect was expressed stronger while they were in privacy. However, in the public context, they could feel it more at all (Gobel et al., 2014). In addition, different cultures may experience endowment effect strength, depending on the activities taken towards it. For example, Japanese people tend to experience a stronger connection to the item when they are not stating specific reasons for their feelings. Meanwhile, for Europeans, the argumentation of their item's values creates a more substantial experience of endowment feeling. Such a controversial result was explained by the cultural difference in Japanese tendency toward self-criticism (Maddux et al., 2010).

Eventually, the possession of the item can be seen from two different perspectives. Moreover, depending on the perspective, it is seen how buying and selling propositions change.

### **3.3.5 Social Influence**

Nowadays, social influence plays a significant role in people's lives. It can not only be positive but also have a damaging influence on a person's life. Social influence became a strong power for changing individuals' emotions, opinions, behaviours, and actions. Fischer et al. (2003) claim that the emotional impact becomes so influential on others because it always has a direction at someone, which makes it socially bonded.

On the Internet, social influence can be embedded into online reviews on the product or service, commentaries and likes under posts, and influencer marketers' suggestions. Jaini et al. (2020) express that consumers tend to scan social media websites in search of opinions on interesting to them products. It was found that a high number of online reviews positively influences buying decisions. Meanwhile, the variety of positive and negative reviews lowers the purchase probability (Minnema et al., 2016). Although social influence has a specific effect on a buyer's decision-making, it can be as well strengthened or weakened by the personality features of a customer, attributes of the product, or the cultural environment around him/her (Jaini et al., 2020; Rompas & Tumevu, 2014; Shaikh et al., 2017).

The effects of social influence can lead to a bandwagon effect. Schmitt-Beck (2015) named it as well a "contagion effect". The phenomena can be explained as a strong influence of mass on a personal opinion, which leads the individual to change his/her actions in favour of

common social belief. Shaikh et al. (2017) found that the bandwagon effect appears more often in collectivistic societies. In such an environment, people are grown with the sense of social opinion being valuable. For example, Pakistani consumers are seeing the trend of buying luxury products from well-known brands as a confirmation of their high social status. As well, Rompas and Tumewu (2014) note that product attributes, like design, style, quality, features, and brand strengthen the willingness to make a purchase. In their research, Samsung Galaxy phones were the targeted product. Respondents found Samsung technology a reliable purchase since, in society's mind, it is one of the leaders in the international market. However, the intention to buy a specific product can be changed due to outside opinions. Family and friends are the two most vital categories of influence.

On the contrary, with the bandwagon effect, people tend to experience variety-seeking behaviour. According to Kahn (1995), variety-seeking behaviour is a tendency to repeatedly make different decisions concerning goods or services. Such behaviour can be explained as consumers' desire to look attractive in somebody else's eyes (Ratner & Kahn, 2002). A study by Ariely and Levav (2000) considered that group choices bring a different level of satisfaction depending on the primacy of answers. As a result, participants of the experiment were more satisfied with their decision, while the primacy of choice was given to them. However, the following participants experienced more regret in choosing the less likeable option, trying to reach the various behaviour from the common.

All in all, social influence has two sides: bandwagon effect and variety-seeking behaviour. Furthermore, both of them have a strong influence on human purchasing decisions.

### **3.3.6 Expectations**

The inner motives of the customer create the need to buy a specific product. However, before purchasing, the customer values his/her decisions and creates expectations about the product, depending on its characteristics. For example, brand acknowledgement can influence the perception of the reliability of a product's quality (McClure et al., 2004). As well as price can influence the experienced pleasantness from the product (Plassmann et al., 2008).

The study by Lee et al. (2006) aimed to show how information given either before or after the consumption of the product creates different reactions. The phenomena were tested via a beer experiment with balsamic vinegar in its ingredient list. It was indicated that information

about the special ingredient given before the tasting process created negative expectations of the taste and resulted in a low preference for the product. However, when respondents were informed about the special ingredient after tasting, the expectations did not interfere with the gained experience; it resulted in independent preference choice.

Talking about the price influence on buyers' expectations, the researchers discovered a strong dependence between price and pleasantness received from it (Plassmann et al., 2008). Contrary to the belief that though there is a substantial build-up of expectations following expensive products, the medial orbitofrontal cortex activity (part of the brain that shows perceived pleasure) showed that the brain naturally could receive more pleasantness from cheap products (Plassmann et al., 2008). Therefore, a person can be persuaded by marketing strategies into buying more expensive products, even when the preference is falling on lower price goods.

Lastly, price affects the expectation of pleasure from buying a specific product and its efficacy (Shiv et al., 2005). The study by Shiv et al. (2005) approved it on the example of energy drinks. The value proposition of the energetic (help to solve puzzles faster) is distorted when the discount is put on the product. Customers have been experiencing negative expectations of the energy drink, and later on, the feelings negatively affected the participants' performance in puzzle solving. It was as well noted that the cause-effect relationship was happening on an unconscious level. In contrast, when the link was openly stated in front of participants, the placebo effect (expectations on the product's efficacy) was not taking place.

Eventually, it has been proved that expectations can be placed on consumers via different product characteristics. However, the sequence of results only happened subconsciously and never occurred while being highlighted.

## 4 QUESTIONNAIRE

In this branch of the thesis, the reader will be able to learn about empirical research conducted by the writer of this paper. The researcher decided to choose a questionnaire as a method for collecting quantitative data. This approach was used to get the latest awareness about sustainability and sustainable products.

The questionnaire has been sent via various Internet channels, disregarding respondents' age, gender, interests, and knowledge. It was made intentionally to have a broader perspective on the concerning topic.

The questionnaire has been divided into four different parts:

1. General questions
2. Which characteristics matter while buying the product
3. Situational questions
4. Future of sustainable products

In the general section of the questionnaire, the researcher intended to know more deeply about the respondents' diversity and their relation and behaviour to the sustainability topic. It was essential to find out the motives for buying and discouragement in abandoning sustainable products.

The section about appealing characteristics of products was based on neuromarketing techniques and their implementation, which was discussed in Chapter 3. These questions are aimed to see whether respondents can notice their subconscious reactions to triggers put in the environment by marketers while making purchases.

The following section presented situational questions, where respondents were put in the virtual environment of the store. The researcher created all three situations using concepts like LIM (less is more), the impact of background emotions on the eagerness to buy the products, and a mix of two previous ones based on neuromarketing studies.

Eventually, the last section was dedicated to the perspective of sustainable products in respondents' lives.

#### 4.1 Analysis of questionnaire data

This section provides the results of the conducted survey.

The total amount of participants equals 110 people. 59 (53.6%) participants are female, and 51 (46.4%) are men. Two major age categories in this survey are people 18-25 (59 people) and 25-44 (45 people); 6 people were older than 45 years old. It is believed that most participants belonged to the younger generation due to the channels of survey distribution: social media, like Instagram, LinkedIn, and Facebook, and the email channel of the researcher's university (Seinäjoki University of Applied Sciences).

The 3rd question in the "General questions" section of the survey was aimed at evaluating sustainable topic actuality in the world (see Appendix 1). In this question, "sustainability" was indicated as the environmental situation we face. Results in Figure 5 indicate that most participants (46.4%) evaluate it as "Extremely important".

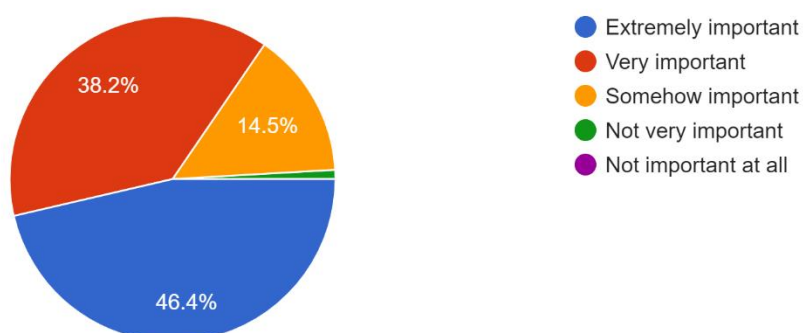


Figure 5. How important do you think the sustainability problem is in the world?

When the results of this question matched the gender of participants (see Figure 6), it was found that women considered sustainability problems to be more extreme than men. This finding confirms Rosati and Faria (2019) that companies with female directors are likelier to follow the sustainability approach of leading the business.

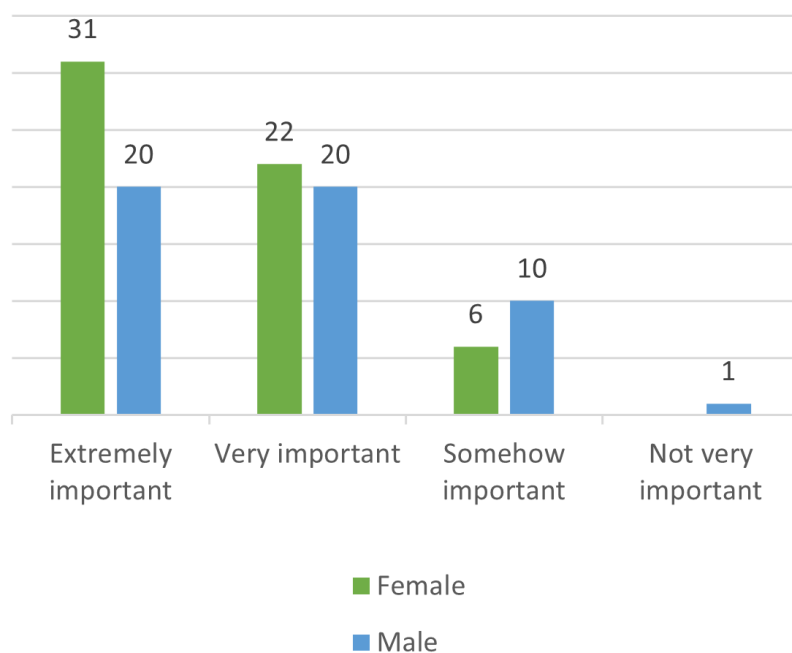


Figure 6. Match of gender of person opinion about sustainability

Since the results of the previous questions showed that at least 17 people expressed the sustainability problem as slightly essential or unimportant, the researcher hypothesized that society lacks information about environmental and SDG-related topics. Therefore, participants were asked whether, in their opinion, there was enough information provided.

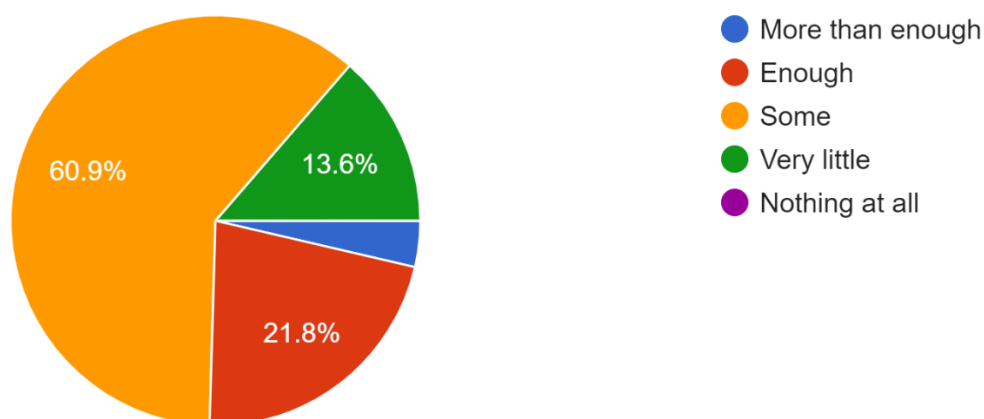


Figure 7. Do you think there is enough information about sustainable products?

The survey showed (see Figure 7) that 60.9% (67 people) believe that there is some of it available, and 13.6% (15 people) say that it is very little. Therefore, due to minor exposure to information on sustainability, the competitiveness of sustainable products can be seen at a low level.

Question 5 of the "General Questions" section (see Appendix 1) has been targeted at evaluating the interest level of participants in the sustainability topic (see Figure 8).

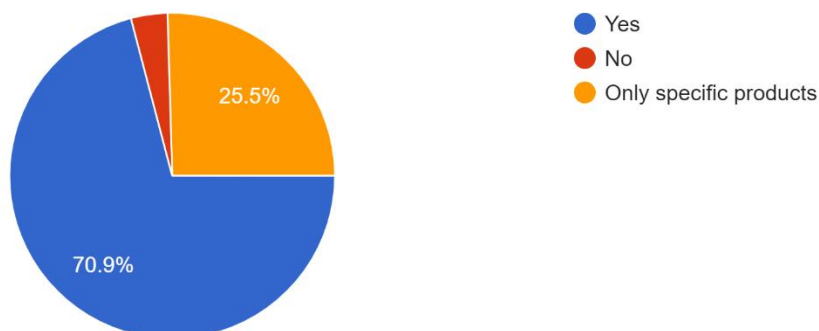


Figure 8. Are you interested in Sustainable products (f.ex. clothes made from recycled fabric, organic food, energy-saving light bulbs, etc.)?

96.4% of participants answered that they are either interested in sustainability topics or only in some products (see Figure 8). The following question (question 6, section "General questions", see Appendix 1) was aimed at seeing the preference for sustainable products by gender. Among male respondents, the sectors of sustainable products were more aware of sportswear, technologies, and energy companies—for instance, Patagonia, Tesla, and PHILIPS. Meanwhile, women were familiar with sustainable products from the fashion, cosmetics, and food sectors - for instance, Organic Basics, Pure Waste, Beyond Meat, and Lumene brands.

Among the motivators for buying sustainable products, quality and personal responsibility played the most vital role (see Appendix 1: question 7, section "General questions"). However, from the literature research conducted before, social influence was also one of the main factors during the decision-making process. Answers to the following question confirmed it (see Appendix 1: question 8, section "General questions"), where 22 respondents mentioned their family and friends, social media, and other recommendations influencing their purchasing decisions.

Moreover, as a closing question of the first section (Appendix 1: question 9, section "General questions"), the researcher tried to find out the reasons for the refusal of sustainable products. First, as a significant challenge, highlighted by 58 respondents (52.7%), the price mentioned. Second place (19.1% of respondents) belonged to the narrow choice of sustainable

products presented. Furthermore, the third major problem (13.6% of participants) was the unwillingness to switch from the familiar products people use regularly.

Previously in the literature research, it was mentioned that a product's characteristics could be a driver for the decision to make a purchase (Rompas & Tumevu, 2014). Therefore, the section "Which things matter to you while buying products" (see Appendix 1) is devoted to different product characteristics and explores whether they influence decision-making from customers' experiences.

The results of the survey question (Figure 9) showed that the beneficial features of the products play an essential role. Although, a secondary factor that supports the benefits of the product is the proposed price. Therefore, beneficial features are closely connected to the price. 61.8% (68 respondents) proved it. The other 35.5% (39 respondents) believe that knowing the product's benefits is enough to persuade them to purchase. The behaviour proves affect heuristic theory of Finucane et al. (2000) when high benefits bring the feeling of lower risk. Figure 10 shows that women are slightly more concerned with the price of sustainable products, despite the benefits' representation, than men.

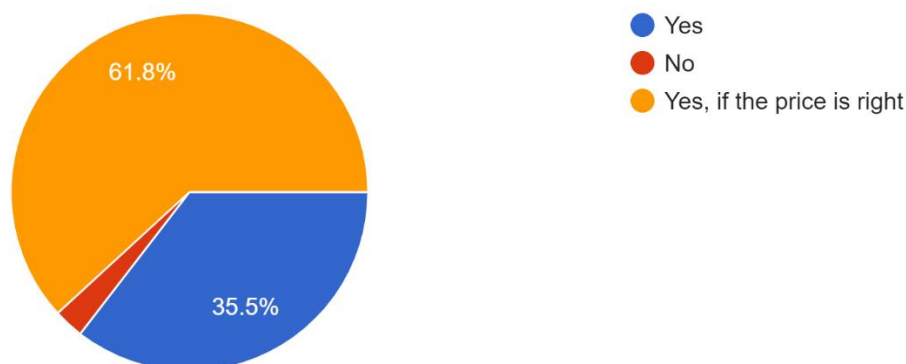


Figure 9. If you knew the benefits of sustainable products, would you prefer them over other products?

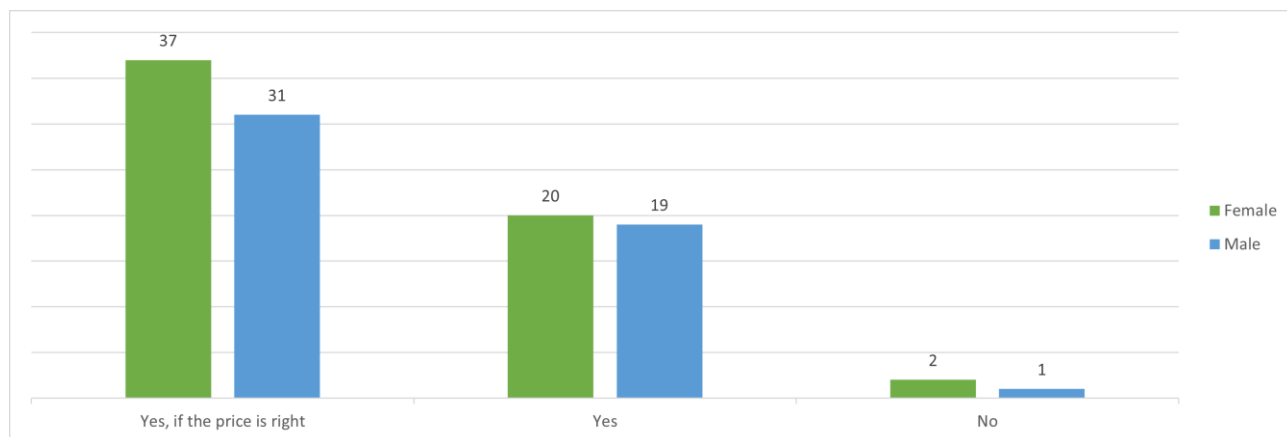


Figure 10. Correlation between gender of respondents and their willingness to buy sustainable product, because of benefits

As one of the results, the survey showed that the design of the product matters (67.3% of respondents). However, the majority answered that only specific product packaging details strongly influence their opinion (18.2 % of respondents). When matching respondents' answers to this question and their gender (see Figure 12), women are more influenced by the product's design; however, when it comes to nutritional value, men tend to pay more attention to it.

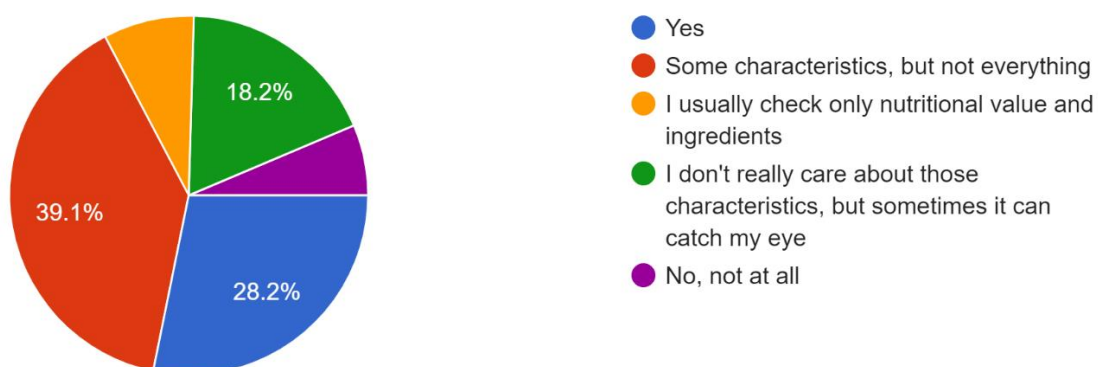


Figure 11. Does the design of the brand matter to you while buying something?

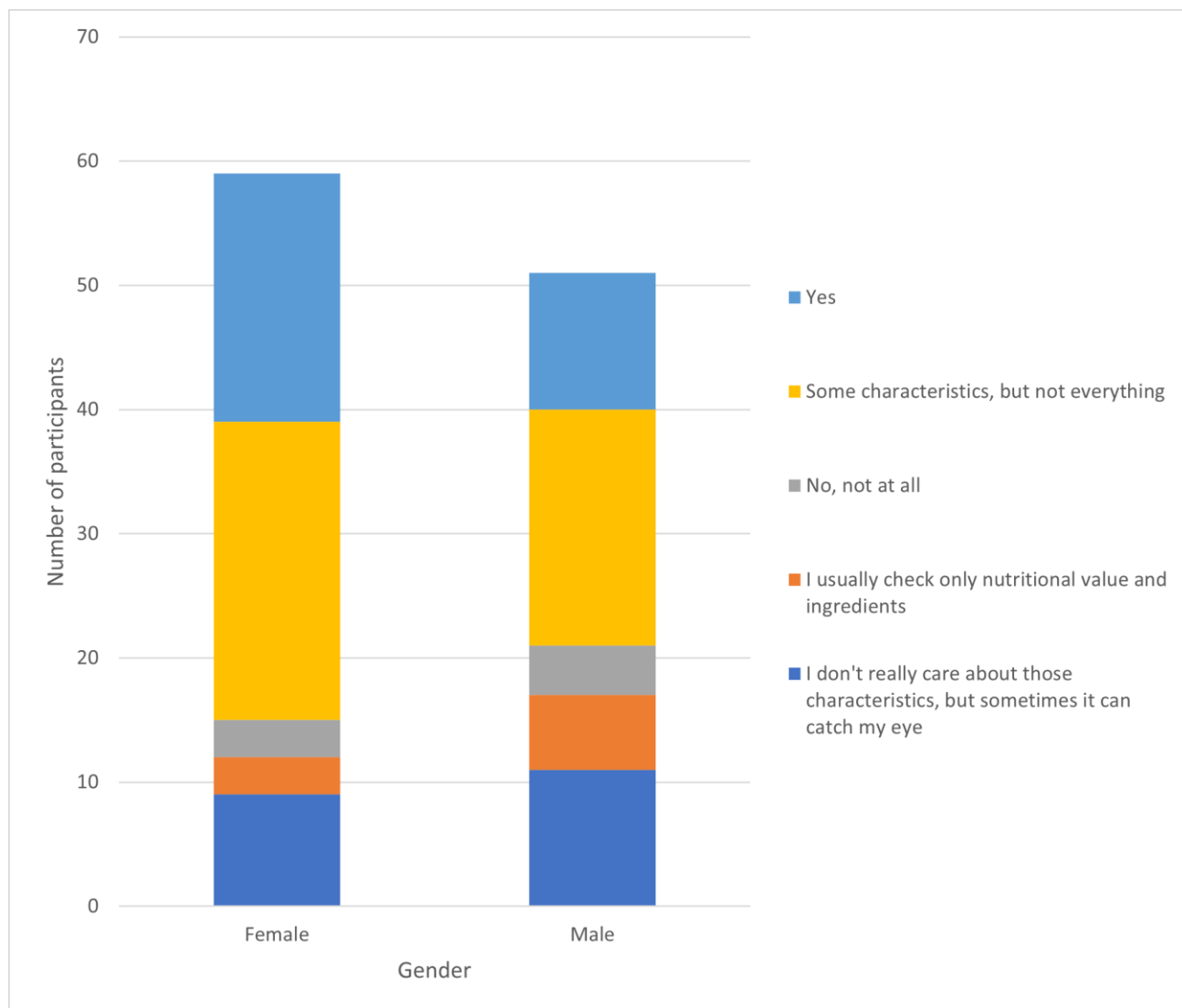


Figure 12. Correlation between gender of respondents and the influence of design on their choice.

Another feature of the products that can make the purchase more appealing is the smell. It has been found that smell becomes a solid trigger to customers during the purchasing process. 70.9% of all respondents, which equals 78 people, confirmed smell as a factor in buying (see Figure 13).

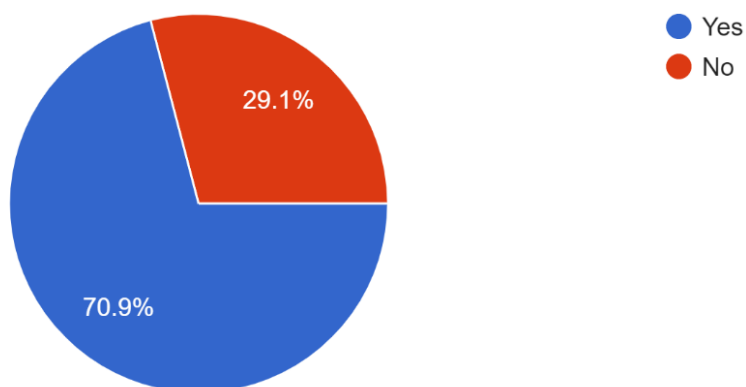


Figure 13. Are you willing to a product more, when there is an appealing smell in the store?

Social influence takes a separate sub-chapter in this paper, which pushed the research to confirm its impact on customers' opinions. As a result, it was proved that social influence plays a significant role in the buying process (75.5% of respondents answered "Yes") (see Figure 14). In addition, women are seen to be more dependent on others' opinions than men (see Figure 15).

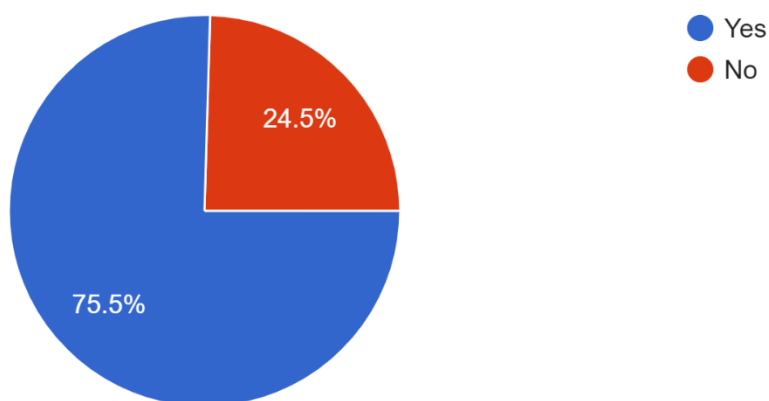


Figure 14. Are you more willing to buy sustainable product if it was recommended by people?

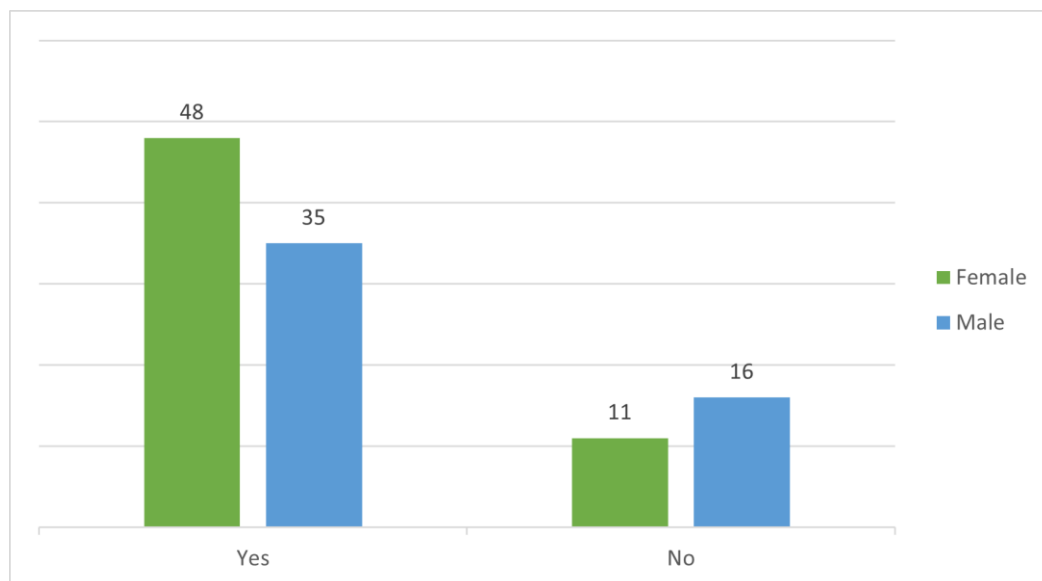


Figure 15. Correlation between social influence (Are you more willing to buy sustainable product if it was recommended by people?) and gender

The next section of the questionnaire (see Appendix 1: Section 3: situational questions) was devoted to situations in which the product selection was presented with and without neuro-marketing technics.

The first question situation (Appendix 1) was aimed at the LIM concept (Traindl, 2007) and therefore became more competitive in comparison with the plain positioning of the product. The survey showed that 69.5% of respondents favour fewer products on the stand number 1. (see Appendix 1, see Figure 16).

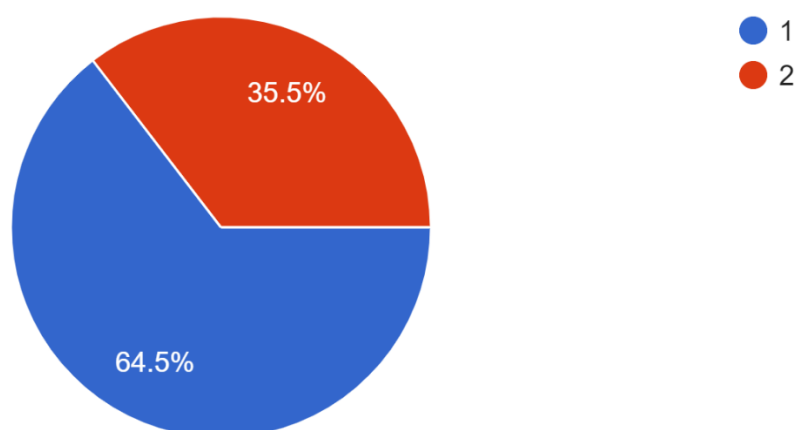


Figure 16. In which picture the sustainable product looks more appealing to buy?

The second question presented the usage of background influence on customers' perception (Appendix 1). According to respondents' opinions, the second stand was more vivid to be sustainable in comparison with the first one (see Figure 17). The significant difference between the two stands was in the green grass background. Since it reminds the customer of nature, they had a faster linkage of this stand to sustainability.

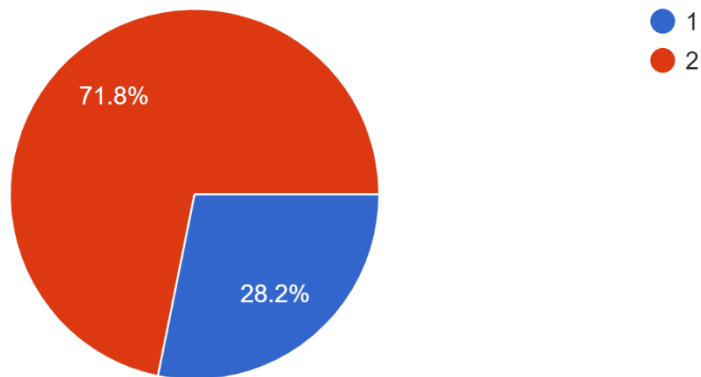


Figure 17. Which one of the stands made you realize faster that the product that is sold is sustainable?

Moreover, the last situation of this section and the first one presented the LIM concept; however, this time, it was aimed at showing how the perception of a product's quality can be changed with the proper positioning (Appendix 1). Respondents voted for the first representation of the product to enhance the premium quality of the shoes, which confirmed the LIM concept to be an excellent tool for improving the brand face of the product (see Figure 18).

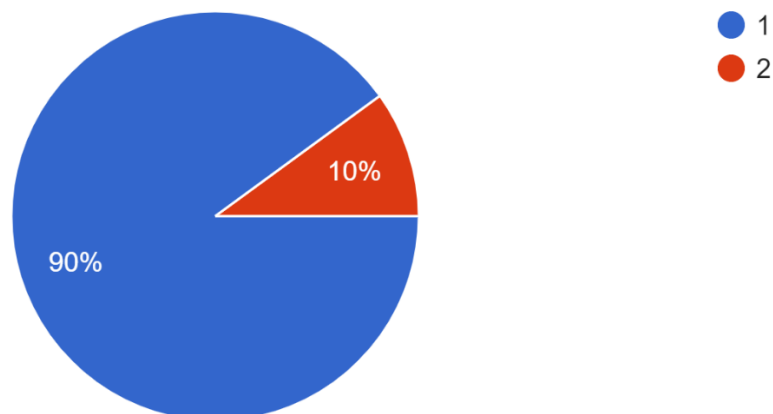


Figure 18. Which stand shows the premium quality of shoes?

The last section of the survey was devoted to the future decisions of respondents concerning sustainable products (see Appendix 1). It showed that most people are willing to invest more money into sustainable products in the future. Moreover, female participants are eager to have more sustainable purchases than before (see Figure 19).

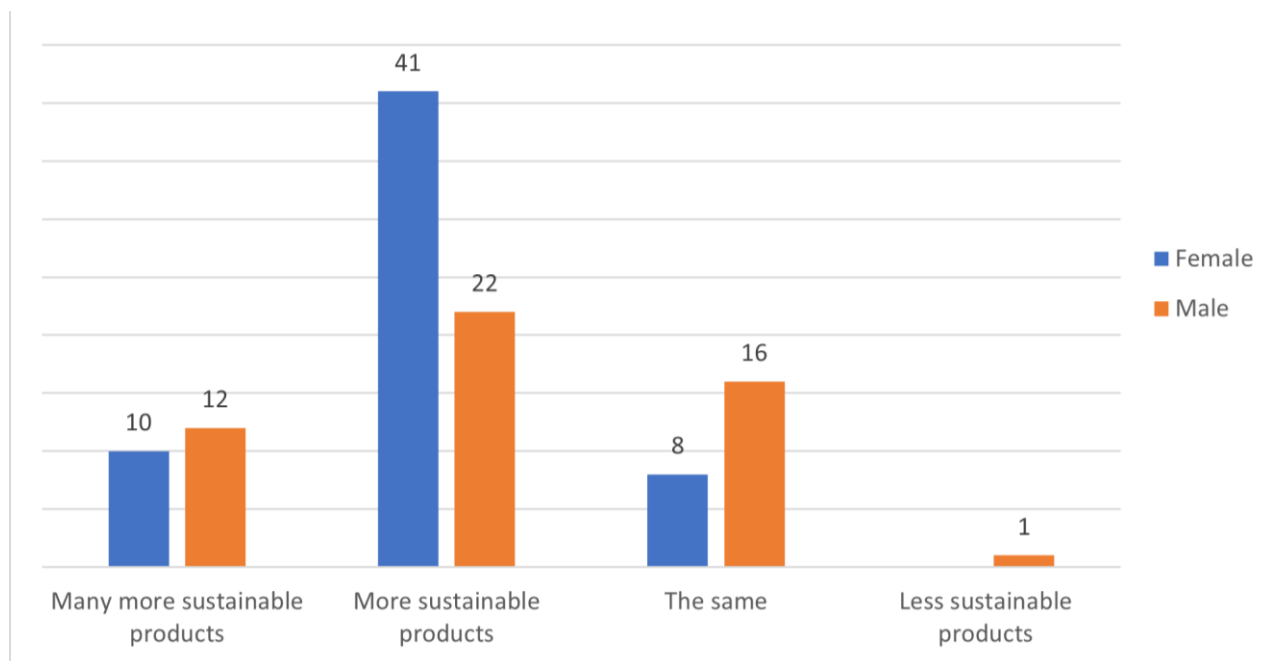


Figure 19. Correlation of gender and future willingness to buy more sustainable products

Eventually, the last question of this survey concerned participants' willingness to pay more money for sustainable products (see Figure 20). Again, the survey results showed that people are more inclined to spend more money if the benefits are favourable (28.2% of respondents) and presented (29.1% of respondents). This finding makes us consider that benefits are closely connected to the high value shown through the price.

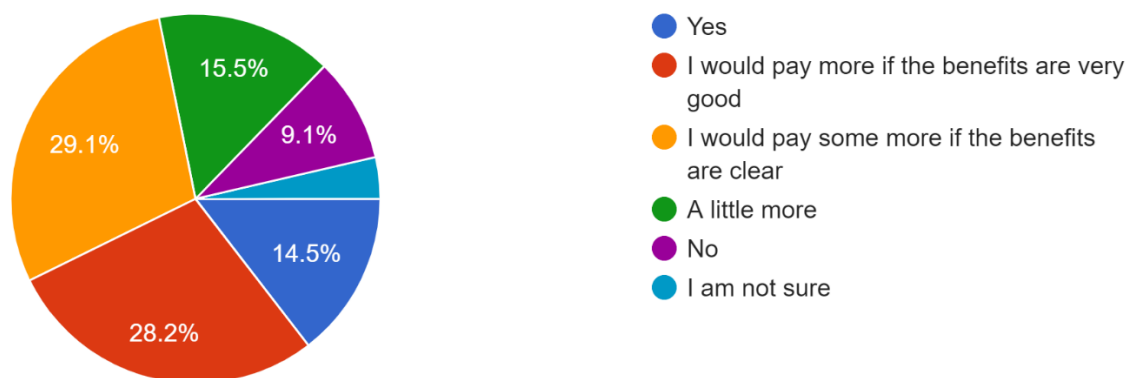


Figure 20. Would you be willing to pay more for sustainable products?

## 4.2 Limitations

This study aimed to enrich the knowledge database about sustainability topics and create new existing data that help with the generation of new hypotheses and approval of old ones. The research was conducted in a questionnaire form, which was the most suitable approach, considering factors such as time, budget, and character of needed data.

Nevertheless, it was acknowledged that the used approach could fail to represent accurate results and the depth of human motives in choosing their answers. For example, the chosen channels for the questionnaire distribution are usually used by the younger generation, which eventually impacted results (53,6% of participants were 18-25). In addition, it was noticed that some of the answers had spelling mistakes, which can be considered as an inattentive attitude towards filling in the survey. More than that, the question about the knowledge ("General questions section", question 6) of any sustainable companies had a non-mandatory character, which led to missing almost half of the participants' responses (56 people did not answer at all). For example, question 5 in the "General Questions" section asked participants about their interest in sustainable products and presented three answers: "yes", "no", and "only specific products". The "only specific products" option could have been created with elaboration characteristics to get to know the profound interest of each participant.

Although the survey could have some improvements, a general trend regarding sustainable products has been created. Most participants acknowledge the seriousness of the environmental problem and are willing to make changes for improvements. It also found that people are more inclined to buy sustainable products if the value proposition is presented correctly. As a last acknowledgement, neuromarketing technics can be a way to the more straightforward representation of sustainable products' value.

Further studies must be conducted with the more advanced coding system to close the nuances of the presented report. In addition, the construction of questionnaire sentences must also be improved to understand the deeper motives of participants' thinking.

## **5 CASE STUDY: SEDAS PLANTEKØKKEN APS**

In the fourth chapter of the research paper, the reader will learn about Seda Plantekøkken Aps company, its current struggles with sales, and the marketing technics the company is applying now. Then an experiment based on the implementation of neuromarketing technics will be explained together with its result, and later on, a further recommendation for sustainable companies.

### **5.1 Seda Plantekøkken history**

Seda Plantekøkken Aps is a Danish start-up founded by Seda Gärtig in March 2021. It is concentrated on producing vegan spreads, like nut butter and hummus. The central ideas of the company are to deliver people "delicious, nutritious and environmentally-conscious spreads" and break the bias that vegan food is bland and tasteless.

The main variety of products consists of 12 spreads: four sweet hummuses, four salty hummus, and four nut kinds of butter. The best-seller among nut butter is Almond Chocolate, and among hummuses, best-selling tastes are Cheesy, Red Pepper, and Stollen Dessert.

However, during main worldwide holidays, like Christmas, customers can try new tastes only available for a specific period. For example, during Christmas 2022, Seda Gärtig introduces three new flavours to her loyal audience: Almond Vanilla, Almond Cinnamon, and Almond Coconut.

### **5.2 Current sales situation**

The researcher will describe the company's sales situation based on the experience received during the practical training as a marketing intern and the conducted interview with the founder of the company, Seda Gärtig.

According to words of Seda Gärtig, the sales situation of Seda Plantekøkken Aps has required improvement. Currently, the company is losing money due to several reasons:

- The production costs are higher than the profit gained from sales
- Customers are buying more actively only during face-to-face events, like markets or exhibitions

- B2B marketing is hard to maintain since the profit is not high and possible collaborations with customers will cost more than Sedas Plantekøkken Aps can afford

It has been noticed that sales of the company are growing in anticipation of various holidays. For example, Mother's and Father's Days, St. Valentine's Day, Christmas Eve, and others.

In addition, there has been an excellent elevation of sales during markets and exhibitions. For example, the closest events at the moment of writing this paper were Organic Plant-based Expo and Torvehallerne. Sedas Plantekøkken team hopes to present itself well during these events, build a stronger connection with the target audience and expand its recognition.

### 5.3 Current marketing situation and its analysis

Currently, there are six people in the marketing team of Sedas Plantekøkken: three workers are responsible for Social Media marketing, one for Photo production, one for video production, and one for paid advertisements.

The thorough analysis of the company showed that the business has already been using some neuromarketing methods unconsciously.

Among those methods are:

- Psychology of free

As an example of this method, Sedas Plantekøkken has been creating multiple giveaways for its customers. Giveaways were in the form of tickets for organized brunches or a box of spreads chosen by customers themselves.

- Loss aversion theory

The loss aversion method was represented in various posts, which informed customers about the limited number of places for brunch or a limited amount of time for getting a discount on the purchase.

- Social influence

Recently, the company collaborated with social media influencers to boost its brand recognition. Such campaigns were successful for Seda Plantekøkken and resulted in more followers on Instagram.

- Option attachment

Seda Gärtig decided to focus on best-selling spreads, which led to sizing down the variety of products. It was made to make room for more innovation and optimize the company's action plan.

#### **5.4 Implementation of marketing technics**

Previously it was discussed that Seda Plantekøkken Aps is experiencing problems with its profit gain. Therefore, the researcher agreed to collaborate with Seda Gärtig and implement neuromarketing technics in real time. Furthermore, Seda Plantekøkken participated in organic products exhibitions - Organic Plant-based Expo and Torvehallerne. Therefore, it was decided to use LIM, background positive influence, and Taste&Touch (sensory marketing) technics in shaping the new arrangement of the exhibition stand.

Picture 5 shows the arrangement of products used before the researcher implements marketing technics. On the left side of the stand, customers could see the price list of presented products. The price list is a hand-written paper with no visuals. It gives a feeling of the unprofessionalism of the company, which becomes the first trigger to the customer. Then, the range of spreads is positioned in the middle of the table with the Taste&Touch station. Talking about this aspect, the researcher has noticed that spreads are positioned without obeying any specific rule and have no symmetry. It can become a disturbing fact for the customers approaching the table.

In contrast, the Taste&Touch point became a valuable part of the stand. It does not only create a positive attitude from being able to try the product but as well help to ease the loss aversion effect (people can taste the product before buying and decide on purchasing the most suitable spreads, according to their taste). On the right side of the stand, the photo represents how spreads can be used together with food and create a future expectation about the possible implementation of the product to their food ration. Eventually, from both sides of the table, the customers can find brochures that describe the company's aim and invite

customers to subscribe to the newsletter. This approach allowed Sedas Plantekøkken Aps to lower the feeling of lost money after buying the product and replace it with a warm and positive feeling of being cared for customers.

As a result, the stand before the collaboration with the researcher has its benefits and drawbacks. The negative aspects of the table representation were changed and improved according to canons of neuromarketing technics.



Picture 5. The arrangement of exhibition stand before the experiment (Organic Plant-Based Expo)

Pictures 6 and 7 represent Sedas Plantekøkken after implementing Neuromarketing technics in collaboration with the researcher.

The difference between stand arrangement before and after represented in the:

- Usage of product's ingredients (almonds and cinnamon) to show the quality
- Using decorations of the table according to season (cones and cinnamon sticks)
- Implementation of symmetrical organization of spreads
- Using brown colour to create the comfortable mood
- Creation of a new price list using positive background influence

The first point reflects the table's design with ingredients used for nut spread production (almonds and cinnamon). According to Traindl (2007), the ingredients' representation helps to boost the perception of a quality product. Therefore, it was decided to show customers the

quality through this technic and, at the same time, put the decoration of the stand onto a higher level.

The variety of spreads presented during exhibitions was dedicated to the Christmas season. Tastes of Christmas in Sedas Plantekøkken Aps include Almond Chocolate, Almond Cinnamon, Almond Marzipan, and Almond Coconut. In previous studies (Mitchel et al., 1995), it was proved that a smell that matches the environment raises the joyous mood of the customer and leads to the improvement of buying possibility. In this case, the light smells of cinnamon and cones correlated with the Christmas atmosphere organized on the stand.

As a symmetrical organization of spreads, it was decided to keep the pyramid as the prominent figure for showing the products. The decision was made because the shape could show the product's quality and the feeling of the preparation process. In addition, only two products were presented on the stand, limiting customers' choices and easing their hesitation in choosing wrong.

Regarding colour implementation, previous studies showed how people perceive different colours. Meanwhile, red can activate excitement, blue brings a feeling of stillness and calmness (Traindl, 2007). In this case, it was decided to use brown, creating comfort home atmosphere and a feeling of safety. Together with the Christmas setting, it became a great way to enhance the overall atmosphere around the table.



Picture 6. The arrangement of exhibition stand After implementation of Neuromarketing techniques (close-up photo) (Torvehallen)



Picture 7. The arrangement of exhibition stand After implementation of Neuromarketing techniques (Torvehallen)

The last point of the improvement list showed the creation of a new price list design (see Picture 8). While creating the pricelist, the researcher considered such neuromarketing methods as LIM and the influence of background emotions. The design was kept minimalistic to

concentrate the attention of potential customers on prices and a beneficial discount deal. The minimalistic approach is represented by plain background, minimal information, except the most important one, and limited use of small elements. The discount vice versa was highlighted by the following smiling emoji that has been proven to incline customers towards the perception of price as enjoyable (Traindl, 2007). The discounted price was circled in a green circle and represented as a green star figure with the percentage. Green is a colour of nature, life and reliability.

As a result, the combination of neuromarketing technics led to improvement, described in the following sub-chapter.



Picture 8. New pricelist version

## 5.5 Results

The results from the experimental use of neuromarketing in real-time have brought a positive change in sales of Sedas Plantekøkken company.

Seda Gärtig, the company's founder, provided the researcher with information on previous sales to compare the before and after situations of using neuromarketing technics.

According to Seda Gärtig, during the previous four days of the food exhibition, the total amount of jars sold equalled 62. In addition, the chosen time of selling the products fell onto weekend days, the busiest days of the week for customers.

Meanwhile, the days for testing the efficiency of marketing technics fell on Fridays and Saturdays. The first day of Tovernhallen, just like the second day, ended up selling out all the spreads. In numerical representation, it was 63 jars, in total. In addition to all products being sold out, Seda Gärtig has received much positive feedback on the decoration of the whole stand. Visitors of exhibitions felt joy while approaching the tables and were mesmerized by the Christmas atmosphere flying around the stand. It was also noted that most of the time, people buy more than one product. Therefore, the 10% discount worked while customers were buying more than 1 product. As a result, it can be concluded that the discount representation positively influenced onto sales process.

All in all, it can be conducted that neuromarketing technics brought a tremendous positive impact on the profit of Sedas Plantekøkken company. Therefore, it is suggested to use the same approach in the future to achieve even better results.

## **5.6 Recommendations for sustainable companies**

Sustainable companies need help in being competitive in the market. The survey showed that 3 of the main reasons for that are price, little variety, and unwillingness to change from the products they are already using.

However, the experiment with Sedas Plantekøkken Aps showed neuromarketing being an excellent solution for solving these problems.

Therefore, the researcher will provide sustainable companies with ten easy ways of improving their sales and competitive strength, using neuromarketing.

Ways of applying neuromarketing to sustainable companies:

- Make sure the company is not too much

The concept of Less Is More showed that the success of product sales is not connected to a wide variety of products shown to customers but the proper representation of a few. Sustainable product quality can be shown by using materials the product is made of or creating space on the representation stand. If the company proposes too many options, it is suggested to choose a few products for primary representation and switch them from time to time.

- Sustainable food companies should let their customers try the product

People are always scared to buy new food products because they need to determine whether they like the taste. Moreover, the perspective of losing money on something they would not like seems even more unappealing. In order to overcome customers' hesitation, sustainable food companies can create taste points while introducing their products to the market. It helps customers find out whether they like a product or not, and companies to build a more defined target audience profile.

- Make sure the smell in the environment is coherent with the smell of the product

It has been found that smell is the most robust sense influencing our emotions. The coherent with the product smell makes customers more attentive towards what they are buying, and they spend more time memorizing the product. In addition, the smell will help to create an environment that will make the customer more positively aimed at buying something. However, avoiding creating an intense smell is essential because the effect works when it has a slight odour.

- Choose the colour palette of the product accurately

Colours have more meaning than just an excellent attribute for decorations. This is because each colour connects with a specific feeling and state of mind. Therefore choosing the colour palette for the company will have a strong impression on its customers, depending on what the company is willing for them to experience. Therefore, the brand must first choose what it wants its customer to feel and then apply colours.

- Create a positive background for products

The environment around the product has a vital role. Customers tend to get all the background information, even if it is not directly connected to the product. Therefore, it is crucial to create a positive message for customers, to direct them onto optimistic associations with the brand. It can be done easily by putting pictures of happy people or having a smiling emoji around products.

- If the price bites, put a smiling emoji next to it

A simple emoji smile has been proven to impact price perception positively. If the price looks too high or too low, put the little emoji next to it, and see how the customer's opinion about it changes.

- Give something for free first, and get customers' loyalty as a reward

The psychology of zero has shown how putting a zero price on the product can remove customers' fear of loss. For example, giveaways or little presents put together with the product during the customer's purchase represent the psychology of free. It will connect excitement feeling with the sustainable brand and create customers' loyalty to it.

- Invest time and money into surrounding the brand with positive social opinion

Nowadays, social influence can either promote the company or destroy it. Sustainable business owners must create a positive reputation to strengthen their competitiveness in the market. They must pay attention to the creation of reviews, promote the company's social media, and involve social influencers in its marketing.

- Gather people to create something together

As one of the neuromarketing methods presented in this research, ownership plays a role in people's connection to the product. It has been found out that the item created by the customer's own hands has more value than just buying something ready. Therefore sustainable companies can create masterclasses where people either cook a dish with specific brand ingredients, sew clothes from recycled clothes, or create a smell with natural ingredients. Depending on the company's sector, there can be various ideas for implementing ownership technic.

- Remember that customers' expectations can identify their decisions

Expectations have an influential role in customers' purchasing process. Therefore it is vital to remember that expectations depend on the price, the packaging, the marketing slogan, and specific information about the product. Sustainable companies have to think through their decisions in giving their target audience any information that can be absorbed because the consequences will predict their decisions.

All in all, following these simple guidelines, can help sustainable businesses to put their product on another level.

## 6 CONCLUSION

The environmental situation is now ringing alarms in every part of the world. Climate change, plastic in the ocean, droughts, tsunamis, chemical intoxication of land, extinction of biodiversity, and many more tragedies are constantly happening. The United Nations claimed the emergent situation needed to be solved as soon as possible.

Meanwhile, the planet Earth is facing the consequences of human actions; governmental organizations started providing individuals, businesses, and other institutions with the plan of lowering the impact on the environment. Although overall progress has been noticed, more is needed to be done to prevent the reach of the no-return point.

On the individual level, it is vital to understand that even though companies are selling the products, the world's population is customers who can make their own decisions. Furthermore, these decisions must be morally related to improving the environmental situation.

Talking about the business sector, it has excellent power to help solve global pollution. Nevertheless, unfortunately, the overconsumption of resources is only growing, unsustainable products have a solid competitive position in the market, and consumer behaviour stays hard to change.

However, a successful brand depends not only on the benefits of the proposed products but also on proficient marketing. The neuromarketing approach has been discovered and developed as a new wave in this sector. It was labelled as "emotional marketing" due to its power to use people's emotions in selling products. Even though it has been drawing much attention from researchers, some consider it a subliminal approach, undermining personal boundaries in making decisions.

The literature research of this paper showed how neuromarketing technics could be used for a good reason. Strengthening the position of sustainable products in the market can help with waste production and the development of conscious customer behaviour. The case of Sedas Plantekøkken company confirmed the strength of neuromarketing. Moreover, it showed how the change could be made by buying environmentally friendly products.

Furthermore, the conducted questionnaire showed that people intend to help the environment, especially the younger generation. This is why it is essential to show support in expanding the knowledge about sustainable behaviour and its positive influence on the environment, starting from a young age. It can help build environmentally-friendly habits early and follow them throughout life instead of learning to break the harmful pattern later on.

All in all, as Mahatma Gandhi, Indian social activist, said:

If you want to change the world, start with yourself.

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## APPENDICES

### APPENDIX 1. Questionnaire: Sustainable products in our life

#### Section 1: General questions

1. Are you male or female?

- Male
- Female

2. What age are you?

- Under 18
- 18-25
- 26-44
- 45 or more

3. How important do you think the Sustainability problem is in the world?

- Extremely important
- Very important
- Somehow important
- Not very important
- Not important at all

4. Do you think there is enough information about sustainable products?

- More than enough
- Enough
- Some
- Very little
- Nothing at all

5. Are you interested in Sustainable products (f.ex. clothes made from recycled fabric, organic food, energy saving light bulbs, etc.)?

- Yes
- No
- Only specific products

6. Do you know any companies that sell sustainable products? If yes, which ones?

- Open question

7. What motivates you to buy sustainable products? (Multiple answer)

- Quality
- Personal responsibility for environmental situation
- Social influence
- Satisfaction from taking care of myself
- Other...

8. Why did you start buying sustainable products?

- I believe I help environment by buying sustainable products
- My friends/family motivated me to make sustainable purchases
- I was recommended to buy a sustainable product
- I was motivated by social media
- Other...

9. What stopes you from buying sustainable products?

- Price
- I am used to the products I use now
- I am not aware of any sustainable products
- The range of sustainable products is too narrow to choose from
- I don't see the benefit from it
- I don't believe it changes environmental situation if I buy them
- Other...

## **Section 2: Which things matter to you while buying products?**

1. If you knew the benefits of sustainable products, would you prefer them over other products?

- Yes
- No
- Yes, if the price is right

2. Does the design of the brand matter to you while buying something? (f.ex. colors, logo, font, packaging)
  - Yes
  - Some characteristics, but not everything
  - I usually check only nutritional value and ingredients
  - I don't really care about those characteristics, but sometimes it can catch my eye
  - No, not at all
3. Are you willing to buy a product more, when there is an appealing smell in the store? (f.ex. coffee smell in the café, smell of croissants in the bakery, specific smell of Massimo Dutti store)
  - Yes
  - No
4. Are you more willing to buy sustainable products if it was recommended by people?
  - Yes
  - No

### **Section 3: Situational questions**

1. In which picture the sustainable product looks more appealing to buy? Choose the number. (You can find the pictures under the question)



- 1
- 2

2. Look at the product stands. Which one of the stands made you realize faster that the product that is sold is sustainable? Choose the number of the stand. (The pictures below)



- 1

- 2

3. Which stand shows the premium quality of shoes? (The pictures below)



- 1
- 2

#### Section 4: Future of sustainable products

1. Do you believe that in the future you will be buying:

- Many more sustainable products
- More sustainable products
- The same
- Less sustainable products
- I will not buy them anymore

2. Would you be willing to pay more for sustainable products?

- Yes
- I would pay more if the benefits are very good
- I would pay some more if the benefits are clear
- No
- I am not sure