



Masters Dissertation in Marketing (BUS5000W)

TITLE

Understanding the Effects of Sustainable Milk Packaging on Consumer Attention by Incorporating Eye Tracking Technology

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ABSTRACT

Understanding the effects of visual stimuli on product packaging is essential for marketers in today's competitive landscape. Consumers encounter an abundance of visual stimuli during their shopping journey including but not limited to the tangible attributes of a product or its packaging, which collectively contributes to the overall product presentation. These elements encompass graphical components, colours, textual features, the packaging size and material. As such, consumers' allocation of attention towards these various elements is an interesting topic to explore. This study aimed to develop of more profound insight of packaging design by examining the effects of distinct visual cues such as colour, icons and the textual elements that communicate sustainability on plant-based milk product packaging from the South African Oat Milk brand *OKJA*. The study aimed to see how these cues influence consumer's visual attention, which is primarily unconscious. The responses of visual attention were measured using eye tracking technology which enables more accurate data measurements of consumers' attention compared to the traditional methods which rely on subjective self-reporting analyses.

To address the research questions and objectives, this study utilised an exploratory research approach. The research method involved four quantitative tasks, followed by the qualitative component of the study which consisted of an interview. The target set of individuals was the young adult South Africans aged between 18 and 27 years old residing in Cape Town, South Africa. A total sample of 90 respondents was acquired through convenience sampling as well as the University of Cape Town database. For this paper, the data was analysed was collected form eye tracking metrics that were generated through Tobii Pro Labs. Tobii Pro Labs measured metrics such as Time To First Fixation (TTFF), Average Fixation Duration and Total Fixation Duration (TFD), which were analysed utilising inferential statistic techniques. Mean tests such as the Analysis Of Variance (ANOVA) and t-tests were conducted to test the hypotheses. In addition, the tests for normality and equality of variance were conducted.

The results of this study have revealed valuable research insights into how various sustainable visual cues on product packaging influence visual attention. Additionally, this research sheds light to the consumers' perception of sustainability across various product packages. By utilising a local oat milk product package *OKJA*, this study addressed important gaps in research in the South African market landscape. As a result, research indicates that the way consumers allocate their visual attention influences their perception of sustainability on product packaging to an extent.

Keywords: *Visual attention, eye tracking, sustainability, OKJA, oat milk*

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CHAPTER 1: INTRODUCTION

1.1 INTRODUCTION

Investigating how visual stimuli influence consumer perception of product packaging is a critical research challenge in today's competitive market, particularly within the South African context. There is research focusing on the effect of retail atmospherics on consumer behaviour and the effect of packaging design on consumer behaviour (Van Ooijen, Verlegh, & Smit, 2017; Vermeir & Roose, 2020). Whilst there is some literature on how consumers react to various product packaging, an improved understanding of packaging design is critical for marketers, and more research is required to analyse which packaging features trigger visual attention (Husić-Mehmedović, Omeragić, Batagelj & Kolar, 2017; Piqueras-Fizman & Spence, 2015; Salnikova & Grunert, 2020).

Furthermore, understanding how to effectively influence sustainable consumption among consumers is becoming increasingly vital. The significance of sustainable consumption is a growing phenomenon with consumers actively changing their consumption habits to mitigate negative effects on the environment (Felix, Gonzalez, Castano, Carrate & Gretz, 2021). Addressing the challenges of balancing a sustainable environment with economic and social growth is crucial, as unsustainable practises present significant risks (Papamichael, Voukkali, Stylianou, Naddeo, Ksibi, Zarra, & Zorpas, 2024). To address possible challenges, the Sustainable Development Goals (SDG's) of the United Nations, specifically SDG 12, emphasise the importance of the sustainable consumption and production of products, taking into account raw materials and water for example (Papamichael *et al.*, 2024). The Sustainable Development Report defines sustainable development as the development which meets the current needs without comprising the future generation's needs (Fischer, Foord, Frecè, Hillebrand, Kissling-Näf, Meili, Peskova & Risi, 2023).

Considerable efforts are aimed at understanding how to inspire consumers to choose environmentally friendly products (Felix *et al.*, 2021). An expanding body of research suggests that consumers are subtly influenced by cues within store environments without consciously being aware of it, ranging from the tangible attributes of the product or packaging that creates the overall appearance of the product (Felix *et al.*, 2021). The visual or aesthetic elements such as the graphical elements, colours, textual elements, or the packaging size and material are important for brands (El-Oraiby & Kiygi-Calli, 2023; Van Ooijen, Franssen, Verlegh, & Smit, 2017; Vermeir & Roose, 2020). This is due to allowing the consumers to interpret the visual cues on the package with less mental exertion compared to the visual elements (El-Oraiby & Kiygi-Calli, 2023).

Overall, food packaging gives consumers insight into food-related information, and it serves as a perfect medium (Kovačević, Mešić, Užarević, & Brozović, 2022). All the information that is displayed on the package, whether it be pictorial or textual, attracts consumers' attention and it has the potential to arouse the desire to buy a product (Kovačević *et al.*, 2022). Verbal cues are seen as a strong motivator for consumers' purchase decision; however, visual cues are just as critical for the predictors of consumer response (Spack, Board, Crighton, Kostka, & Ivory, 2012).

Research suggests that packaging colours play an important role in product judgements, thus influencing the purchasing of environmentally friendly products (Felix *et al.*, 2021). For instance, environmentally friendly products are designed to have natural colours such as green (Herbes, Beuthner, & Ramme, 2020). In a study recently conducted by Vila-López, Kuster-Boluda & Alacreu-Crespo (2021), it was found that the variations in the package design such as the label colour influenced consumers' food perception (Kovačević *et al.*, 2022). Similarly, the study conducted by Van der Laan (2012) found that the attractiveness of the visual packaging design is a significant determinant of food selection (Kovačević *et al.*, 2022). Additionally, consumers perceive an alignment between eco-friendly products and green packaging, thereby fostering more favourable perceptions of the product's environmental impact (Felix *et al.*, 2021).

Research has further been conducted with regards to the effects imagery has on the responses on advertising, with Scott (1994) stating that the classical conditioning or the affective response of an image has the ability to generate a connection with a brand that is generally automatic, affective or unconscious (Spack *et al.*, 2012). Moreover, studies have shown that visual cues evoke a heightened sense of vividness, requiring minimal active thought for the impact to be felt (Rebollar, Gil, Lidón, Martín, Fernández, & Rivera, 2017). On the other hand, the verbal cues demand a greater degree of cognitive effort, requiring individuals to consciously engage with and interpret information (Rebollar *et al.*, 2017). Textual claims influence the way through which a food product is perceived, and research has shown that the expectations of a product highly depend on the textual information which is present on the package (Rebollar *et al.*, 2017). This study exclusively explored the elements of product package design for instance colour, visual cues such as icons as well as the verbal cues or the textual claims. The investigation specifically focussed on OKJA's oat milk product packaging, which is a local South African brand.

The rising popularity of plant-based milk among consumers around the world makes it an intriguing topic to study since the study of sustainability is becoming an increasingly important practice, as well as the fact that plant-based milk in South Africa is estimated to grow by 23% during the 2024 - 2027 period, reaching an estimated

USD 273.6 million in 2027 (Pointke, Albrecht, Geburt, Gerken, Traulsen, & Pawelzik, 2022; Modor Intelligence, 2023). The factors contributing to the growth of plant-based milk in the market include but are not limited to the individuals' intolerance to dairy products, dairy allergies, consumer concerns with regards to hormones as well as the potential wellness advantages offered by the plant-based milk (Tangyu, Muller, Bolten & Wittmann, 2019). Thus, the consumption of plant-based milk extends beyond the individuals who are vegan. OKJA was the chosen milk product package for this study, due to their packaging being easily accessible and popular in the South African market. However, with this in mind, this investigation extends beyond OKJA's packaging, and it has the potential to guide plant-based milk companies in general. The targeted set of individuals for this study were young adults (individuals between the ages of 18 and 27 years old) residing in Cape Town, South Africa. Considering the significant purchasing power of this cohort as well as their propensity for engaging in sustainable consumption behaviour, this age group was deemed to be most pertinent within the scope of this study. By analysing the responses of this particular group, this paper aimed to gain insights into the strategic optimisation of sustainable-oriented visual cues on product packaging.

This study presented a comprehensive analysis of examining the effect of milk product packaging on consumer attention. It aimed to uncover the research gaps such as gaining a deeper understanding of packaging design by examining the effects of various visual cues that communicate sustainability on plant-based milk product packaging, which originate from the Cue Utilisation Theory (CUT). The cue utilisation theory encompasses the cognitive process whereby information is obtained to produce a certain behaviour (Clement 2015; Ladeira, Nardi, de Oliveira Santini, & Jardim, 2019). Marketing literature emphasises the importance of these cues whereby the consumers' quality perception for brands is potentially formed or altered (Mishra, Malhotra & Saxena, 2021). This theory comprises of which cues consumers utilise to recognise environmentally friendly packaging (Herbes *et al.*, 2020). As such, these consist of structural cues, visual cues, information on environmental impact as well as the sensory cues. The aim was to see how specific implicit and explicit cues influence the consumer's visual attention, which is primarily unconscious (Husić-Mehmedović *et al.*, 2017; Motoki, Saito & Onuma, 2021). The responses to visual attention were measured using eye tracking technology, which is a consumer neuroscience tool that is used to assess participants' eye-related responses and attentional processes. Within the expanding multidisciplinary domain of consumer neuroscience, this approach is deemed as a highly significant instrument for the quantitative evaluation assessment of diverse marketing cues (Harris, Ciorciari & Gountas, 2018).

Furthermore, eye tracking technology was the chosen tool since it is a non-invasive, portable, and versatile technology that enables researchers to gain more profound insight in understanding of human behaviour (Tobii, 2022). By employing eye tracking technology, researchers can better understand consumer behaviour. Eye tracking

allows for analysing eye movements, the duration of attention, the path of eye movement, facial movements as well as everything that is associated with the signals in behavioural motivations (Escandon-Barbosa *et al.*, 2023). Eye tracking uses infrared-emitting diodes to meticulously measure and analyse eye movement patterns (Sung, Wilson, Yun, & Lee, 2019). Compared to traditional methods which rely on subjective self-reporting analyses, neuroscience tools such as eye tracking enable more accurate data measurements of consumers' attention (Harris, Ciorciari & Gountas, 2018). This study offers a comprehensive and insightful analysis of the extant literature within the field of consumer neuroscience, with a particular emphasis on the interplay between consumer attention and product packaging design. Eye tracking was therefore utilised to measure consumers' visual attention on the various modified product packages, focussing on colour, iconography as well as textual claims. This research holds the potential to help the marketers and the researchers to understand the relationship between consumer attention and perceived sustainability, taking into account plant-based versus non-plant-based milk consumers.

1.2 BACKGROUND TO THE STUDY

This section clarifies the fundamental concepts and the underlying theory of the research study. Firstly, consumer neuroscience is mentioned as well as briefly discussing eye tracking technology. The importance of sustainable consumption is then discussed, given its growing relevance in the market. The topic of product packaging design is then debated within the South African context, along with the importance of marketing messaging in this context. Lastly, the role of consumer attention relating to the South African consumer landscape is discussed.

1.2.1 Consumer Neuroscience

Consumer neuroscience is rapidly growing field that has gained traction over the recent years, and it is increasingly replacing the traditional self-reporting methods (Daugherty & Hoffmann, 2017). Historically, self-reporting techniques were commonly used which aim to capture the conscious expressions or feelings or the verbal responses from participants in a study (Sánchez-Fernández, Casado-Aranda, Bastidas-Manzano, 2021). While self-reporting is popular among the researchers for its ease of use and cost-effectiveness, it is prone to biases and cannot measure deeper emotions, subconscious thoughts or the “moment-by-moment” data collection (Sánchez-Fernández, Casado-Aranda & Bastidas-Manzano, 2021).

Consumer neuroscience enables researchers to answer questions that were previously difficult to fully explain, such as the reasons behind the consumer's product choices or brand preferences (Royo-Vela & Varga, 2022). Neuromarketing is a technique that is used in market and academic research within consumer neuroscience, and it helps to understand how consumers react both consciously and

unconsciously to marketing (Daugherty & Hoffmann, 2017; Royo-Vela & Varga, 2022). Harrell (2019) defines neuromarketing as the assessment of physiological and neural responses to understand consumer behaviour including their motivations, preferences, and decisions. This understanding informs the strategies related to advertising, pricing, product development and marketing tools (Bhardwaj *et al.*, 2023).

Neuromarketing at its core, involves integrating neuroscience with marketing strategies to understand the influence of marketing on the consumer's purchasing processes or consumer behaviour (Royo-Vela & Varga, 2022). Neuroscience encompasses a set of sciences that studies the nervous system, and it allows the access to the physiological and cognitive phenomena occurring in a consumer's brain (Royo-Vela & Varga, 2022). This includes the brain's reaction to stimuli such as advertisements, brand logos, packaging, or imagery (Royo-Vela & Varga, 2022). Neuromarketing aims to seek insights beyond traditional techniques such as surveys and focus groups. This study therefore delved into the utilisation of both quantitative and qualitative tools, utilising a mixed research methodology. The quantitative aspect involved a consumer neuroscience tool which was eye tracking technology, whereas the qualitative component involved an interview with participants.

1.2.2 Eye Tracking Technology

Eye tracking is defined as a tool that is commonly used to measure consumers' visual attention (Carter & Luke, 2020). It is generally utilised to assess eye movements and the changes in pupil dilation and contraction (Harris, Ciorciari & Gountas, 2018); to determine the direction of the gaze from an individual based on the position of the eye at a duration of time and its moving sequence, as well as different fixation durations (Huddleston, Behe, Driesener, & Minahan, 2018). There are two types of eye tracking devices, a screen-based eye tracker (otherwise known as remote or desktop) or eye tracking glasses which are mobile (Farnsworth, 2017). A screen-based eye tracker was utilised for the purpose of this investigation. A screen-based eye tracker captures eye-movements from a distance and it is typically mounted onto a screen or computer (Farnsworth, 2017). A screen-based eye tracker was the preferred device for this study as screen-based stimuli such as the images of the milk product packages (rather than the physical packages) were tested on screen.

Eye tracking research methods aim to measure consumers visual attention, by providing invaluable insights into consumer behaviour (Casado-Aranda & Sanchez-Fernandez, 2022). New age eye tracking technologies have been seen to provide moment-by-moment insights into the attentional processes, which allows the researchers to evaluate the communication effectiveness and the visual attention concerning their marketing stimuli, such as their advert or product (Casado-Aranda & Sanchez-Fernandez, 2022). Researchers are increasingly adopting eye tracking technology to inform their understandings of consumer shopper behaviour in in-store

environments (Huddleston *et al.*, 2018). Over recent years, research has revealed the evolution and innovation of novel packaging across a diverse range of food and drink products, including the dynamic realm of fast-moving consumer good products (Piqueras-Fiszman, Velasco, Salgado-Montejo, & Spence, 2013). Researchers are tirelessly working to innovate new packaging formats in attempt to create a “multisensory” packaging experience for consumers (Piqueras-Fiszman *et al.*, 2013). However, research also suggests that certain attributes contribute to the broader multi-sensory stimulus, thereby effectively conveying pictorial or descriptive information about the product (Piqueras-Fiszman *et al.*, 2013). Therefore, it is imperative to understand the diverse visual stimuli of product packaging and their implications on visual attention. This exploration was facilitated through the use of eye tracking technology and the integration of existing research to address the research question effectively. There are various eye tracking metrics that can be utilised, however, for the purpose of this study, the Time to First Fixation, Total Fixation Duration as well as Average Fixation Duration were utilised. Lastly, the topic of sustainable consumption is an integral aspect of this paper, since oat milk product packaging was tested using eye tracking technology.

1.2.3 Sustainable Consumption

According to the Oslo Symposium (1994), sustainable consumption is defined as using products and services to meet an individual’s basic needs and to enhance the quality of life whilst minimising natural resource usage. This is to ensure the well-being of future generations (Lappeman, Egan, Rightford & Ramogase, 2021). While both the company and the consumers’ approach to sustainability is vital, both are evolving in their own way (Lappeman *et al.*, 2021). A rising trend of sustainable consumerism has promoted a reduction in meat products in diets, and research has shown that a lot more South African consumers are opting for plant-based diets (Lappeman *et al.*, 2021).

An important framework regarding sustainability is the Sustainable Developmental Goals (SDGs) as proposed by the United Nations (Ramutsindela & Mickler, 2020). They are a collection of 17 goals which are designed to address the challenges that are faced globally. This includes but is not limited to gender, equality, poverty, crime, hunger, climate change, justice as well as peace (Ramutsindela & Mickler, 2020). The SDGs were set in 2015 by the United Nations, and they hope to achieve these goals by 2030 (Lappeman *et al.*, 2021). With a heightened emphasis on sustainable business practises and SDGs, numerous organisations, both globally and locally, have realigned their business objectives according to the SDG’s. In accordance with the SDGs, it can be argued that *OKJA* are working towards SDG number 12, which is responsible consumption and production.

It is also important to delve into sustainable consumption within a South African context, as several factors need to be considered (Lappeman *et al.*, 2021). With a Gini coefficient of 0.63, research has shown that South Africa has one of the highest inequalities globally (Lappeman *et al.*, 2021). Inequality is evident from an imbalanced income distribution and unequal access to opportunities (Lappeman *et al.*, 2021). The high unemployment rate additionally heavily contributes towards the inequality in the country, further emphasised by the median wage being R3 300 on average (Lappeman *et al.*, 2021). Thus, it is critical to consider affordability and education levels regarding sustainability in the South African market. Furthermore, in the context of this research, it is noteworthy that a large majority of the South Africans do not perceive sustainable or plant-based diets as being feasible options, consequently impacting their purchasing decisions. However, it will not necessarily impact their attentional processes, thus ensuring minimal interference with the study. Therefore, the design of product packaging along with various visual elements is vital to explore for this research.

1.2.4 Product Packaging Design

Product packaging design is a crucial area of research since an increasing body of research indicates that consumers are subtly influenced unconsciously within the retail environment, specifically focussing on product packaging (Van Ooijen *et al.*, 2017). Thus, the impact of product packaging design has recently emerged as an important area of research (Van Ooijen *et al.*, 2017). Product packaging design is crucial for the brands as it enables them to attract consumers' attention at the point of sale. There have been numerous studies suggesting how the individual packaging cues influence consumer expectations and perceptions of various attributes (Van Ooijen *et al.*, 2017), however, there is a lack of research into consumers' attentional processing within a South African context.

Visual cues such as the colour, shape or material are the key elements that have been extensively studied over many years. However, there are limited studies examining how subtle package design cues such as explicit information influences consumer behaviour (Van Ooijen *et al.*, 2017). Therefore, understanding the effects of both explicit and implicit product attributes is essential for the brands seeking to influence consumer attention. This study explored both explicit and implicit product packaging information, focussing on colour, iconography and well as textual elements. This research is therefore important for the researchers, as there has been limited research conducted surrounding subtle packaging design cues and the distribution of consumers visual attention, specifically on oat milk product packaging in the South African marketplace.

1.2.5 Visual Attention

Attracting consumer attention is a crucial objective in marketing, and one effective method for assessing visual attention is through the utilisation of eye tracking technology (Daugherty & Hoffman, 2018). Attention involves the capacity for the selective control of limited cognitive resources (Lindsay, 2020). This process involves a sequential pattern comprising of fixations and saccades (Husić-Mehmedović *et al.*, 2017). Visual attention is thus paramount for consumers to gather information about a product. Orquin and Loose (2013) highlight visual attention's pivotal role in decision-making as it enhances visual processing and alters consumer perception (Ladeira *et al.*, 2019).

In accordance to Awh, Belopolsky, and Theeuwes (2012), visual attention is influenced by both the top-down and bottom-up processes as well as various other factors such as the selection history or mere exposure effect (Vriens, Vidden & Schomaker, 2020). Bottom-up attention is a more involuntary process, whereby consumers are influenced by stimuli in the external environment (Ladeira *et al.*, 2019; Schütt, Rothkegel, Trukenbrod, Engbert, & Wichmann, 2018). In contrast, top-down attention stems from long-term visual memory and it is considered to be more of a voluntary process that guides visual attention based on the consumer's goals triggered by a given stimulus (Ladeira *et al.*, 2019). Both these attentional processes can directly affect consumer choice, or indirectly affect choice through attention (Vriens, Vidden & Schomaker, 2020). Consumers do not always focus on all the necessary information that is presented on food product packaging, labelling, or in-store displays. Therefore, it can be assumed that the information or the visual cues on product packaging can influence consumers' food choices and preferences only if they manage to capture their attention (Van Loo, Grebitus, Nayga, Verbeke & Roosen, 2018). Attention allows individuals to selectively utilise information, thereby assisting them in their decision-making process (Van Loo *et al.*, 2018).

1.2.6 Theoretical and Conceptual Framework

The theoretical framework and the underpinnings of this study were based off papers by Ischen, Meijers, Vandenberg and Smit (2022) as well as Piqueras-Fiszman, Velasco, Salgado-Montejo and Spence (2013). The study by Ischen, Meijers, Vandenberg and Smit (2022) aimed to assess the prominence and environmental attributes of eco-friendly packaging cues (Ischen *et al.*, 2022). It examined whether the implicit (packaging material) and explicit (eco-labelling) product packaging cues enhance the perceptions of environmental friendliness (Ischen *et al.*, 2022). Furthermore, another foundational paper by Piqueras-Fiszman, Velasco, Salgado-Montejo and Spence (2013) provided a framework for this paper. This research paper employed eye tracking technology and word association tasks to measure attentional processing in

response to changing aspects of the jam jar product packaging. Building on this approach, the current study similarly made use of eye tracking technology and incorporated a word-association task in the experiment. The packaging of plant-based milk products was modified similarly to the jam jars in the study by Piqueras-Fiszman, Velasco, Salgado-Montejo and Spence (2013).

Moreover, the conceptual framework was based off frameworks by Herbes *et al.* (2020) and Casado-Aranda *et al.* (2023). These frameworks were employed to determine the visual cues and the visual attention elements that were used in the current study. The framework developed by Herbes *et al.* (2020) presents numerous visual cues in the diagram that was utilised in the paper (which be shown in. Chapter 2). However, this study specifically focussed on the visual cues such as eco-labels and colour, alongside informational cues such as verbal information. Thus, this research utilised this framework and was incorporated into the conceptual model. Various colours such as green, beige and brown were employed, along with icons such as the recycle symbol, the vegan icon and the Forest Stewardess Council (FSC) logo. Additionally, verbal cues such as “vegan”, “plant-based” and “dairy-free” were used.

Elements of the framework by Casado-Aranda et al (2023) were additionally integrated to develop the conceptual framework. Specifically, the stimulus factors outlined in the mode (which is shown in Chapter 2) relate to the stimuli under investigation in this study, which is the design of plant-based milk packaging. This approach facilitated the measurement of the respondents' visual attention. It is important to note that this conceptual framework is underpinned by several supportive studies that inform its development.

1.3 PROBLEM STATEMENT

This research seeks to investigate how various visual stimuli on sustainable milk packaging influences consumer attention and perception, with the aim of understanding the factors that drive consumer engagement in the context of sustainable packaging, which is limited in the space South African market research. The significance of sustainable consumption and business practises has grown apparent over recent years with close attention being paid to distinctive product attributes and the strategic marketing efforts that shape attitudes towards sustainable consumption (Sharma & Jha, 2017; Meixner, Riefler & Schanes, 2021). Numerous products are continually vying for consumers' attention, and it is important for sustainable products to be perceived as being more visually salient to attract consumers' attention (Smit, Boerman, & Meurs, 2015). Research is abundant concerning the effects of various environmentally friendly cues in advertising (Matthes, Wonneberger, & Schmuck, 2014; Schmuck, Matthes, & Naderer, 2018), as well as a small portion of research about product packaging cues (Popovic, Bossink, & van der

Sijde, 2019). However, the findings do not yet interpret how various implicit (subtle or indirect elements that convey information without overtly stating them) and explicit (straightforward elements that specifically convey information) visual product packaging cues may influence consumer attention towards those packages (Ischen *et al.*, 2023; Liem, Groen & van Kleef, 2022).

Recent literature indicates that consumers instinctively utilise both implicit packaging cues, including packaging material, and explicit cues such as imagery or labels, to recognise environmentally friendly food choices (Granato, Fischer, & van Trijp, 2022). A cross-sectional study conducted by Herbes *et al.* (2020) suggests that individuals commonly depend on both explicit and implicit cues to discern the environmental friendliness of packaging. Nonetheless, there is limited research exploring consumers' responses to these visual cues, with more emphasis being placed on conventional self-reporting measures (Liem *et al.*, 2022). To address this research gap, this paper aimed to investigate the impact of including implicit visual cues pertaining to colour and iconography, and explicit visual cues pertaining to textual elements on the *OKJA oat milk* product packaging, with the primary objective being to understand its influence on consumer attention and the consumer's perception of sustainability.

Furthermore, there is limited research that exists regarding the product packaging of the plant-based milk brands in the South African marketplace, with most studies being conducted in a European context (Liem *et al.*, 2022; Ischen *et al.*, 2022). This gap was aimed to be addressed by employing neuromarketing techniques and tools such as eye tracking technology within a South African context by utilising a South African plant-based milk brand, *OKJA*. This elicited the critical insights equipping the marketers with the capability to accurately anticipate consumer attention and forecast it by assessing eye tracking metrics (Bhardwaj, Rana, Behl, & Gallego de Caceres, 2023). Additionally, this research concentrated on discerning the distinct product packaging attributes such as colour, icons and textual elements, and comprehending the perceived sustainability among the young adults (individuals aged 18 and 27 years). Moreover, a comparative sample was utilised, whereby the plant-based milk and the non-plant-based milk consumers' responses were compared.

1.4 RESEARCH QUESTION AND OBJECTIVES

Given the above information, this study aimed to answer the following research question: To what extent do the implicit cues (colour and iconography) and the explicit (textual) visual cues on product packaging which are aimed at communicating the sustainability of plant-based (oat milk) products, impact the visual attention and perceived sustainability among the young adults living in Cape Town, South Africa?

1.4.1 Primary Research Objective

Through the investigation of the aforementioned research question, this report focussed on achieving the following primary objective: To explore the differences of the sustainable visual cues on visual attention and the perceived sustainability of oat milk product packaging. Specifically, the visual cues that were utilised were: colour (green, beige, and brown), icons (recycle logo, vegan logo and FSC logo), as well as textual elements (“plant-based” “vegan” and “dairy-free” copy).

1.4.2 Secondary Research Objectives

To determine the proposed research question, the following secondary research objectives were addressed with regards to the plant-based and non-plant-based milk consumers living in Cape Town, South Africa as a target population:

- To assess how plant-based milk product packaging including colour, iconography, and text indicative of sustainability impacts consumers distribution of visual attention.
- To establish whether plant-based milk packaging including colour, iconography, and text indicative of sustainability influences consumers perceived sustainability.
- To determine the relationship between the visual attention generated by visual sustainability cues and perceived sustainability.
- To identify the difference between the visual attention generated from the product packaging and the sustainability cues.
- To evaluate the difference between the cues that communicate sustainability and perceived sustainability.

1.5 RESEARCH METHODOLOGY

This study utilised a mixed-method approach, integrating quantitative empirical techniques to measure unconscious responses to stimuli, along with qualitative research methods used to evaluate conscious responses to stimuli (Harris, Ciorciari & Gountas, 2018). Using both these methods can help to clarify the results of quantitative research, and the two approaches often complement each other (Malhotra, 2010).

The quantitative aspect of this paper involved an eye tracking experiment, following a conclusive, causal research design, since the aim was to explain the cause-and-effect relationships between the visual cues that communicate sustainability and attention (Malhotra, Nunan & Birks, 2017). Before the study began, the participants underwent

a screening process to determine their eligibility based on the study criteria, and whether they were consumers of plant-based milk. Every participant sat 65 – 70cm from the eye tracker and screen. After a 9-point calibration of the eye tracker, the instructions for the task were displayed on the screen for around 5000 – 10000ms prior to each task (Piqueras-Fiszman *et al.*, 2013).

The first task included a flash exposure of the packages, where the participants were exposed to the packages for a period of time. The second task instructions read: “An image of a milk product package will appear on the screen for 2.5 seconds. Please look at it and then follow the task instructions presented on the screen thereafter. A total of 10 images will appear individually”. For the third task, the participants were instructed to verbally express one word out loud that described their impression of the package. The word association task was based on the research conducted by Piqueras-Fiszman *et al.* (2013), as well as the experiments conducted by Neural Sense. The third task fell under the qualitative component of the study. The participants were then presented with the fourth task which followed an A/B format, where the respondents selected the package they perceived to be more sustainable by pressing the left or the right arrow key on the laptop. This process was repeated until every package was shown compare to its counterpart in its category of colour, icons and textual claims respectively, thereby resulting in a total of 90 slides with two milk product packages on each slide.

The qualitative approach of this study involved collecting non-numerical data that was consequently analysed through interpretation and observations. At the end of the experiment, the participants were involved in a short interview focussing on their perception of sustainability. Overall, the entire experiment lasted approximately 15-20 minutes.

The targeted set of individuals for the study were between the ages of 18 and 27 years living in Cape Town, South Africa. The sample size aimed to get around 65 respondents, as the suggested minimum number of respondents per group is 30 individuals, as per the Neural Sense experiments conducted in the past as well as in accordance to Payne, Rigby, Stewart, Tate, and Vass (2018). Thus, plant based, and non-plant-based milk drinkers were the two groups. The sampling method utilised for the purpose of this study was non-probability sampling. This is where the members of the population do not have known probability of being chosen in the sample (Bhardwaj, 2019). There are various types of non-probability sampling techniques, however, the chosen technique was convenience sampling. The sample was collected through the UCT database, as an email was sent to the students of the University of Cape Town informing them of the study and the participation requirements.

1.6 ORGANISATION OF THE STUDY

The research paper is constructed as follows:

Chapter 1: Introduction – Presents an overview of the study, providing the research questions and the primary and secondary research objectives.

Chapter 2: Theoretical Framework – Comprises of the theoretical framework, whereby the theoretical foundational framework of the study is explicitly detailed. The foundational studies upon which this paper was based upon are discussed, as well as the frameworks upon which the conceptual framework was based on.

Chapter 3: Literature Review – Consumer neuroscience, eye tracking and metrics, the importance of sustainability, packaging design, visual attention is discussed, and the conceptual framework is depicted.

Chapter 4: Methodology – The research philosophy, the research design, sampling techniques and size as well as the data collection methods and measurement instruments are discussed herein. Moreover, the data analysis techniques as well as the ethical considerations are discussed in depth.

Chapter 5: Presentation of Results – Presents the results of the quantitative and the qualitative statistics.

Chapter 6: Conclusions and Recommendations – Discusses the conclusions and recommendations, as well as the appropriate limitations and the future research recommendations.

CHAPTER 2: THEORETICAL FRAMEWORK

2.1 INTRODUCTION

This chapter lays out the theoretical foundation of this study, illustrating how various studies were synthesised to form the foundational framework of the study to guide the research. It begins by discussing two foundational studies to demonstrate their role for this research paper. Subsequently, two frameworks are presented to illustrate the formation of the literature review and the conceptual model which is depicted in Chapter 3.

2.2 THEORETICAL FRAMEWORK

This study explored how product packaging and various visual cues influence the perceived sustainability of products. The aim of this study was to explore how these various visual cues presented on product packaging affect consumer attention utilising eye tracking technology as a measurement tool. While existing theory addresses environmentally friendly packaging, visual cues, and visual attention outcomes, it lacks a theoretically grounded framework that was empirically tested and specifically examines the connection between these variables. Thus, this study drew on two foundational studies and two theoretical models to develop a comprehensive theoretical framework.

2.2.1 Foundational Studies

This paper was built upon two foundational studies, with the first study being conducted by Ischen, Meijers, Vandeberg and Smit (2022). This study sought to evaluate the prominence and the environmental attributes of the eco-friendly packaging cues (Ischen *et al.*, 2022). It examined whether the implicit (packaging material) and the explicit (eco-labelling) product packaging cues enhance the perceptions of environmental friendliness (Ischen *et al.*, 2022). Previous literature suggests that consumers primarily rely on these cues to identify environmentally friendly product packaging (Van der Laan *et al.*, 2015). Various products are always competing for the consumer's attention, thus making it important for packaging characteristics to be perceived as being more visually salient (stand out) to attract consumers (Smit *et al.*, 2015). Therefore, for environmentally friendly products, packaging cues should not only be prominent but also enhance perceptions of environmental friendliness (Magnier & Schoormans, 2015). Although there is an abundance of literature regarding the effects of the environmentally friendly cues in advertising, the literature regarding the effect of product packaging cues is becoming increasingly important (McGuicken & Palomo-Vélez, 2021; Popovic *et al.*, 2019). Findings are limited regarding the utilisation of how the implicit and explicit visual packaging cues influence perceived environmental friendliness on the packages.

Literature suggests that consumers inherently rely on implicit and explicit packaging cues to identify sustainable packaging (Granato *et al.*, 2022). Implicit environmental cues, such as shape or material, are associated with specific product attributes by consumers, although they do not directly assert the product's environmental benefits (Granato *et al.*, 2022). For instance, cardboard packaging may have a more environmental “look and feel”, than plastic packaging, but not necessarily meaning it is more eco-friendly (Granato *et al.*, 2022). On the other hand, explicit cues directly convey the food attributes of the product, such as an eco-label (Granato *et al.*, 2022). However, it is unclear whether these explicit and implicit product packaging cues influence the perceived sustainability of the food products and how these cues interact (Ischen *et al.*, 2022).

The main research question explored in this study was: “To what extent do the different food packaging cues (i.e., implicit, and explicit) influence salience and the perceptions of environmental friendliness (“greenness”) of the food products?” (Ischen *et al.*, 2022). Therefore, this study will contribute towards the current research by focussing on the implicit and the explicit visual cues in the research design. Specifically, it used the implicit visual cues pertaining to the eco-labels or the environmentally friendly icons as well as the textual cues such as “vegan”, “dairy-free” and “plant-based” on the plant-based product packaging of the *OKJA* oat milk. Additionally, this study incorporated eye tracking technology to determine how these visual cues influence the perceived sustainability of product packaging from the unconscious consumer's perspective, considering the responses from plant-based versus the non-plant-based milk consumers.

The paper by Ischen *et al.* (2022) further acts as a foundational study for the current research since it focussed on two types of visual processing: stimulus-driven and goal directed processing. Stimulus-driven, also known as bottom-up processing, is triggered from environmental information and their surroundings (Ischen *et al.*, 2022). This type of processing suggests that consumers are more likely to focus on aspects that stand out to them (Meißner, Musalem, & Huber, 2016). Research on this topic suggests that size and colour on product packaging are the most significant factors influencing salience and focal attention (Pieters & Wedel, 2007). However, there is limited literature regarding the implicit visual cues such recyclability, standing out against other factors such as colour and material (Ischen *et al.*, 2022).

Eye tracking research has shown that the product package labels which are the explicit visual cues, are the most attention-grabbing areas on a product package (Piqueras-Fizman *et al.*, 2013). This suggests that both explicit and implicit visual cues have the potential to capture attention and promote perceptions of environmental friendliness (Ischen *et al.*, 2022). However, it is crucial to recognise that an environmentally friendly packaging cue does not automatically ensure that a product will be perceived as environmentally friendly (Ischen *et al.*, 2022).

On the contrary, stimulus-driven or goal-directed processing, also referred to as top-down processing, depends on motivation and personal characteristics (Smit *et al.*, 2015). Therefore, it is important to consider “green consumerism”, where consumers aim to satisfy their needs without harming the environment (Sharma & Joshi, 2017). The consumers with strong environmental beliefs tend to exhibit more sustainable buying habits, which in turn stimulates top-down processing in terms of perceived sustainability (Ischen *et al.*, 2022). Moreover, research indicates that green consumers might interpret environmentally friendly product packaging cues in a distinct manner compared to the non-green consumers due to the higher levels of environmental concern. This difference in processing means that green consumers respond differently to the environmentally friendly information displayed on product packaging, and their purchase intentions are strongly influenced by the sustainable product attributes (Ischen *et al.*, 2022).

Building on this theory, the present study focused on two groups: plant-based milk drinkers and non-plant-based milk drinkers. The green consumers or the plant-based milk drinkers were compared to the non-green consumers to analyse their perceived sustainability and attention processing when presented with plant-based milk product packaging (Ischen *et al.*, 2022).

Furthermore, another foundational paper by Piqueras-Fiszman, Velasco, Salgado-Montejo and Spence (2013) provided a framework for this paper. This research paper employed eye tracking technology and word association tasks to measure attentional processing in response to the changing aspects of jam jar product packaging. Building on this approach, the current study similarly used eye tracking technology and incorporated a word-association task in the experiment. The plant-based milk product packaging was modified similarly to the jam jars in the previous study.

The packaging of a food and beverage product is known to influence consumer evaluation, attention, and purchase decisions (Piqueras-Fiszman *et al.*, 2013). In recent years, there has been a global surge in innovation in food and drink product packaging (Piqueras-Fiszman *et al.*, 2013). Despite efforts to create a “multisensory” packaging experience from a psychological perspective, many aspects of the packaging are sometimes only perceived visually (Piqueras-Fiszman *et al.*, 2013). Therefore, this paper integrated consumer neuroscience into the experimentation to explore which elements enhance consumer response to specific packaging (Piqueras-Fiszman, Ares, & Varela, 2011). In summary, this study employed eye-tracking technology and word association tasks to obtain in-depth insights into how packaging elements influence consumer perception and behaviour.

Eye tracking technology has become a valuable tool in consumer research and marketing, as it allows the researchers to track where a consumer’s attention is focussed on in real-life situations (Pieters & Wedel, 2007). This technology helps to

organise visual information and uses fixations to understand where an observer's visual attention is concentrated (Piqueras-Fiszman *et al.*, 2013). Fixations are periods of relatively stable gaze, during which visual processing is presumed to be collecting information. These are usually assessed by their frequency and duration, and numerous studies have investigated eye movements and attentional processing using this approach (Piqueras-Fiszman *et al.*, 2013).

Word Association (WA) is a straightforward and rapid qualitative method frequently used in psychological research (Ares, Giménez, & Deliza, 2010). It involves providing a stimulus to the respondents and recording their first thoughts that come to mind, thereby providing relatively unrestricted access to their mental associations (Piqueras-Fiszman *et al.*, 2013). This task is useful in uncovering the information about the attributes consumers associate with a particular product or image (Piqueras-Fiszman *et al.*, 2013). Traditionally, the initial associations or beliefs about a product are believed to be strongly linked to consumers' behaviour toward that product (Ajzen & Fishbein, 1980). In the context of food products, the associations that first come to mind for consumers are ought to be the most relevant, as they can influence their product choices, purchasing decisions, and overall consumer behaviour (Piqueras-Fiszman *et al.*, 2013).

The WA tasks and eye tracking technology offer unique insights into consumers' product evaluation, thus allowing the researchers to gain a better understanding of the mind of the consumer compared to the traditional self-reporting studies (Piqueras-Fiszman *et al.*, 2013). Eye tracking yields information on both the subconscious projection of the participants and their attentional engagement (Piqueras-Fiszman *et al.*, 2013). On the other hand, word associations access the participants' conscious thoughts and associations after evaluating the product (Piqueras-Fiszman *et al.*, 2013). Although eye tracking allows people to see what aspects of a product the consumers pay attention to, it does not necessarily tell us what information has been communicated to the consumers. Thus, only focussing on the information relevant to attentional engagement is beneficial to test. The word associations allow researchers to better understand consumers' cognitive and affective processes (Piqueras-Fiszman *et al.*, 2013).

2.2.2 Theoretical Works Underpinning this Study

This study further drew support from the Cue Utilisation Theory (CUT) framework, which was originally proposed by Easterbrook in 1959 (Olsen, 1972; Olson, 1978). Sustainable purchase decisions are seen to be highly complex, and they often cause "information overload" (Weinrich & Spiller, 2016). The study by Herbes *et al.* (2020) employed this theory to investigate which cues consumers utilise to recognise environmentally friendly packaging. The cues can take on numerous forms such as structural, informational, or visual in terms of shape or colour.

It is highlighted that consumers are becoming more conscious of the impact of product packaging on the environment, thus leading to a heightened interest in more sustainable options and what consumers recognise as “green”. The decision-making process for environmentally friendly packaging is often highly complex, thus leading to “information overload” for the consumers (Herbes *et al.*, 2020). Previous research has also suggested concerns about consumer’s ability to evaluate packaging solutions.

To simplify the complexity of evaluating packaging sustainability, consumers often search for simple cues. This phenomenon aligns with the Cue Utilisation Theory (Herbes *et al.*, 2020). The CUT views products as bundles of cues indicating specific product attributes, rather than bundles of utilities as other theories suggest (Herbes *et al.*, 2020). These cues can manifest in various forms, including the packaging structure or size, informational or textual cues and visual cues such as colours and shape (Herbes *et al.*, 2020). The cues can be intrinsic to the product, such as packaging material, or extrinsic, such as an “eco-label” (Herbes *et al.*, 2020).

This study focused on three specific cues on the modified plant-based product packaging: eco labels, colour as well as verbal information. These cues, as illustrated in the figure below, have been shown to influence judgments regarding the environmental impact of a product's sustainability claims (Herbes *et al.*, 2020). However, not all the elements from the figure were utilised in this current study. Instead, the visual cues and information related to environmental impact were highlighted.

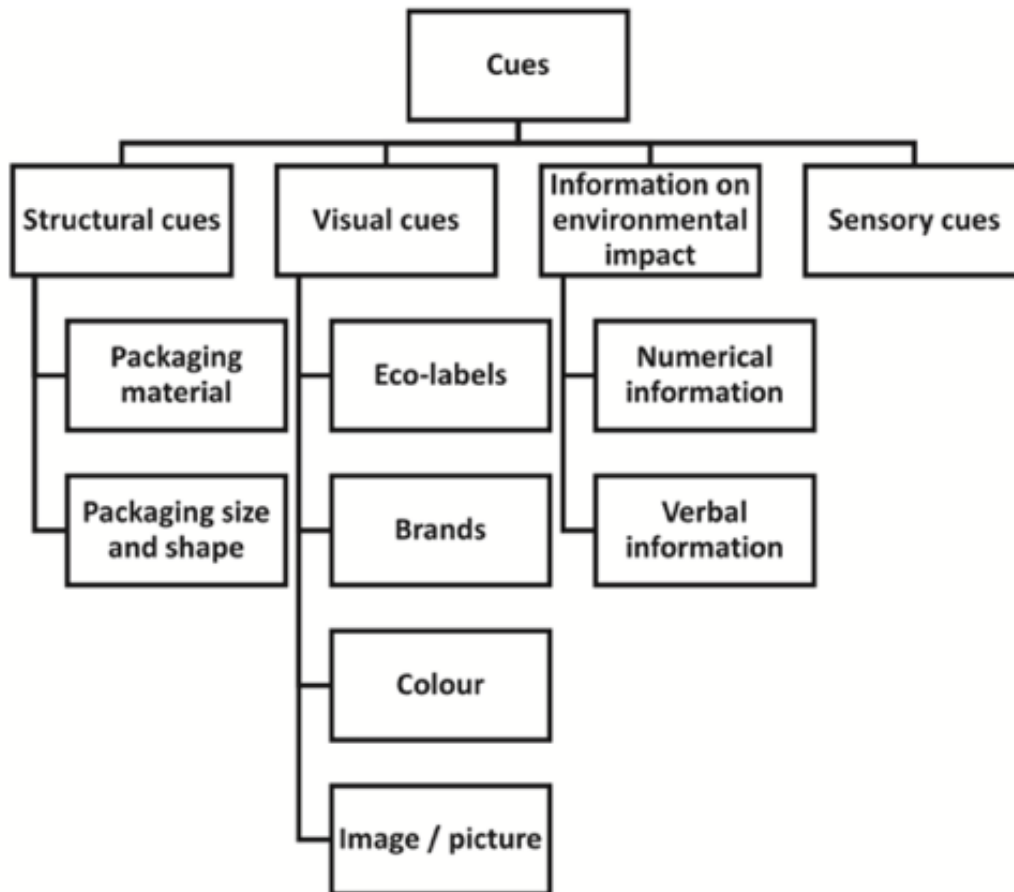


Figure 1: Cue Utilisation Theory Framework (Herbes *et al.*, 2020)

Amongst the visual cues, the eco-labels have been identified in numerous studies to influence consumers' perception of the sustainability of the packaging or the product itself (Herbes *et al.*, 2020). For example, in a qualitative study conducted by Magnier and Crié (2015), the eco-labels such as the recycle label or the carbon footprints were deemed more helpful in judging a product's packaging (Herbes *et al.*, 2020). Similarly, another study noted an increase in perceived product greenness amongst the respondents when a "green product seal" was presented on laundry detergent (Weinrich & Spiller, 2016). In this study, the product packaging cues included the recycle logo, the universally recognised vegan "V" icon as well as the "FSC" logo.

Additionally, the packaging colour as a cue for sustainability on products has been examined in consumer research as it is a cue for the eco-friendliness for the brands and their product packaging (Seo & Scammon, 2017; Magnier & Crié, 2015). Consumers often associate colours such as green, brown, or the dull colours with environmentally friendliness (Herbes *et al.*, 2020). Additionally, the imagery of leaves, a green globe or other similar images are seen to cue eco-friendliness (Herbes *et al.*, 2020). Based on this research, the colours green, brown and a yellow beige were used on the current research paper's product packaging. Thus, the *OKJA* original oat milk packaging was modified to those specific colours.

Informational cues regarding the environmental impact are seen to be more detailed than the previously mentioned simple cues, and they have also been shown in various studies to influence the perceived sustainability of a product (Herbes et al., 2020). These cues can be specific to the product packaging information such as stating, “BPA free” (Magnier & Crié, 2015). Verbal information is considered more effective than numerical information, as it informs the consumers about the contents in the package or a simple environmental claim that indicates sustainability (Gleim, Smith, Andrews, & Cronin, 2013). Consumers may also show different perceptions of credibility in terms of the strength of the environmental claim. Therefore, the textual information regarding the milk product was incorporated into the modified package such as: “vegan”, “plant-based” and “dairy-free”. Overall, the model above depicts the two cues from the CUT framework which were incorporated into the study.

Furthermore, this study drew upon a model presented in a paper by Casado-Aranda *et al.* (2023) as a foundational framework, as depicted below. The primary focus of that paper was to assess communication effectiveness utilising eye tracking technology. Modern eye tracking technology has opened numerous opportunities for evaluating consumer behaviour and communication effectiveness by minimising cognitive biases (Casado-Aranda *et al.*, 2023). This growing body of research incorporating eye tracking technology allows a more in-depth understanding of consumer attention (Casado-Aranda *et al.*, 2023).

Capturing consumers’ attention has become increasingly difficult in the advertising landscape. Attention is a limited resource as a multitude of stimuli constantly vying for the consumer’s attention exceeds the individuals’ limited processing capabilities (Casado-Aranda *et al.*, 2023). Therefore, improving advertising effectiveness is extremely beneficial as it heavily relies on the factors that influence consumers attention (Casado-Aranda *et al.*, 2023). To overcome this challenge, eye tracking has become a popular tool to understand “moment-by-moment” physiological data instead of using regular self-reporting analysis techniques (Casado-Aranda *et al.*, 2023). Thus, the framework below depicts the visual attention process, which ultimately was the focus of measure for this study.

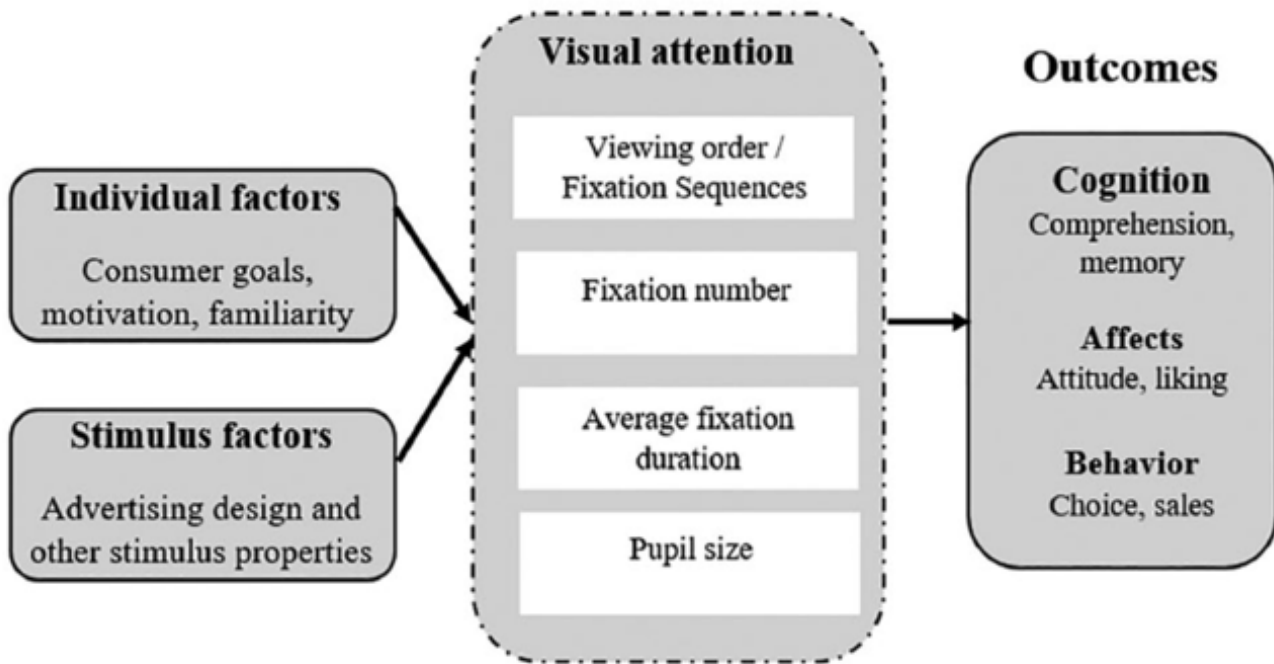


Figure 2: Visual Attention Framework (Casado-Aranda *et al.*, 2023)

2.3 CONCLUSION

This chapter discussed the theoretical underpinnings of the study, including the foundational studies and the frameworks that informed the conceptual model, which will be depicted in Chapter 3. The papers by Ischen *et al.* (2020) as well as by Piqueras-Fizman *et al.* (2013) were utilised due to their focus on product packaging, with Piqueras-Fizman *et al.* (2013) incorporating eye tracking technology. Ischen *et al.* (2020) provides evidence that both explicit and implicit environmental friendliness cues can enhance perceived sustainability among consumers (Ischen *et al.*, 2022), which is consistent with previous research studies indicating that the consumers rely on cues to assess a product's environmental impact. This finding aligns with the theoretical framework from the study conducted by Herbes *et al.* (2020). Additionally, the study investigated whether the green consumers are more adept at recognising sustainable visual cues more easily compared to the non-green consumers. Surprisingly it was discovered that the non-green consumers perceive implicit and explicit visual cues as equally sustainable as the green consumers do (Ischen *et al.*, 2022). This suggests that factors beyond perception, such as motivation or price, play a significant role in influencing consumer behaviour toward sustainable products (Ischen *et al.*, 2022), which was important to take into consideration for the current study. The aim of the paper by Piqueras-Fizman *et al.* (2013) was to gain insights regarding the consumers' perception of product packages in the non-goal directed tasks. The purpose of utilising both eye tracking and word association tasks for the same group of participants was to examine both fixation patterns as well as the variability of associations for the products. Therefore, the current study employed both

techniques, thus aligning with the methodology established in the foundational study by Piqueras-Fiszman *et al.* (2013).

Additionally, the frameworks from Herbes *et al.* (2020) and Casado-Aranda *et al.* (2023) were employed to determine the visual cues and the visual attention elements that were used in the current study. The framework developed by Herbes *et al.* (2020) presents numerous cues, however, this study specifically focused on the visual cues such as the eco-labels and colour, alongside the informational cues such as the verbal information. Thus, this research utilised this framework and it was incorporated into the conceptual model. Various colours such as green, beige and brown were employed, along with icons such as the recycle symbol, the vegan icon and the FSC logo. Additionally, the verbal cues such as “vegan”, “plant-based” and “dairy-free” were used.

Elements of the framework by Casado-Aranda *et al.* (2023) were further integrated to develop a conceptual model, which is shown in Chapter 3. Specifically, the stimulus factors outlined above relate to the stimuli under investigation in this study, which is the design of plant-based milk packaging. This approach facilitated the measurement of the respondents' visual attention, by using the metrics depicted in the accompanying figure. It is important to note that this conceptual framework is underpinned by several supportive studies that inform its development. The following chapter is an extensive review of the extant literature. This review aimed to succinctly summarise the key findings from the past studies, thereby facilitating the construction of a robust conceptual model. Rooted in the foundational and the frameworks explored from this chapter, the conceptual model served as a comprehensive model for ensuing research. Following on from this chapter, the literature will be reviewed in depth.

CHAPTER 3: LITERATURE REVIEW

3.1 INTRODUCTION

The literature review serves to deepen the understanding of existing research on the topic at hand. It summarises the key findings from past studies, as well as elaborates on the constructs in the theoretical frameworks. It also highlights the frameworks' relevance. Finally, a conceptual model is presented to provide a framework for the study.

3.2 CONSUMER NEUROSCIENCE AND NEUROMARKETING

The methodologies and techniques used in academic and market research are constantly advancing, with neuromarketing emerging as a key example of this evolution. (Royo-Vela & Varga, 2022). Practitioners and academics have explored how market research can be enhanced through the integration of innovative tools and methods, such as consumer neuroscience (Alvino, Pavone, Abhishta, & Robben, 2020). Consumer neuroscience is a field that has gained traction over the recent years, and it is increasingly replacing traditional self-reporting methods (Daugherty & Hoffmann, 2017). Historically, advertising and business research relied on self-reporting techniques such as surveys, focus groups or interviews to analyse consumer behaviour in response to advertising (Sánchez-Fernández, Casado-Aranda & Bastidas-Manzano, 2021). Self-reporting techniques are designed to capture participants' conscious expressions, emotions, and verbal responses (Sánchez-Fernández, Casado-Aranda & Bastidas-Manzano, 2021). While self-reporting is popular among researchers due to it being easy to use and being cost-effective, it is prone to biases and cannot measure deeper emotions, subconscious thoughts or the "moment-by-moment" data collection (Sánchez-Fernández, Casado-Aranda, & Bastidas-Manzano, 2021).

Consumer neuroscience enables researchers to answer questions that were previously difficult to fully explain, such as reasons behind a consumer's product choices or brand preferences (Royo-Vela & Varga, 2022). Neuromarketing is a technique that is used in market and academic research within consumer neuroscience, and it helps to understand how consumers react to marketing on both conscious and unconscious levels (Daugherty & Hoffmann, 2017; Royo-Vela & Varga, 2022). Harrell (2019) defines neuromarketing as "the measurement of physiological and neural signals to understand consumer behaviour including their motivations, preferences, and decisions". This understanding informs the strategies related to advertising, pricing, product development and marketing tools (Bhardwaj *et al.*, 2023).

This highly evolved discipline represents the perfect fusion of consumer behaviours, economics, psychology, and neuroscience (Daugherty & Hoffmann, 2017).

Neuromarketing has been embraced by many researchers and industry leaders as a preferred method due to its scientific and objective approach to measurements (Daugherty & Hoffmann, 2017). The goal of neuromarketing is to apply methodologies, principles, and the research findings of neuroscience to comprehend the neurological and physiological attributes underlying consumer behaviour (Daugherty & Hoffmann, 2017).

While advertising is predominantly creative in nature, neuromarketing can add more value by comprehending the influence of advertisements on the consumers (Thomas, Pop, Iorga, & Ducu, 2017). Neuromarketing at its core, is about applying the principles, methodologies, and research of neuroscience to examine how marketing impacts consumer behaviour and purchasing decisions (Royo-Vela & Varga, 2022; Thomas *et al.*, 2017). As a field of research, neuromarketing is relatively new, and it continues to develop its empirical and theoretical implications for research (Thomas *et al.*, 2017). Neuroscience encompasses a set of sciences that studies the nervous system, and it allows access to the physiological and cognitive processes that take place in a consumer's brain (Royo-Vela & Varga, 2022). This includes the brain's response to stimuli such as advertisements, brand logos, packaging, or imagery (Royo-Vela & Varga, 2022). Neuromarketing aims to seek insights beyond traditional techniques such as surveys and focus groups (Royo-Vela & Varga, 2022).

Lindstrom (2008) suggests that neuromarketing is not just the convergence of neuroscience and marketing, but it also holds the key to uncovering the subconscious emotions and desires that fuel the consumer decision-making processes (Royo-Vela & Varga, 2022). Research indicates that a large majority (85-90%) of purchasing decisions are made unconsciously, with 60% of these decisions being made under four seconds (Royo-Vela & Varga, 2022). Furthermore, studies have shown that consumers tend to rationalise their purchase decisions only after making the purchase, and they are often unable to articulate the reasons for their behaviour or their preferences (Royo-Vela & Varga, 2022). This underscores the inseparable connection between the mind and brain, with purchase decisions frequently occurring in the subconscious mind, as influenced by prior experiences or emotions (Royo-Vela & Varga, 2022).

A significant portion of neuromarketing aims to explore various marketing stimuli, such as product packaging, or the utilisation of imagery that captures consumer attention (Thomas *et al.*, 2017). Attention refers to the cognitive recognition of stimuli within an environment, indicating an elevated level of awareness (Thomas *et al.*, 2017). Consequently, attracting consumer attention is the goal for any marketer, and various neuromarketing tools enable researchers to delve into these subconscious decisions, thus offering a more precise and in-depth understanding of the consumer decision making process. In essence, neuromarketing aims to analyse the emotional impact of products, brands, or advertisements on consumer behaviour at the point-of-purchase

(Royo-Vela & Varga, 2022). This is achieved through utilising various technologies that uncover information from the unconscious, emotional, and irrational parts of a brain in response to various marketing stimuli (Royo-Vela & Varga, 2022). Therefore, the technology and the methods that are used for analysing neuromarketing are constantly evolving and changing. The methods and metrics that are most used in consumer neuroscience are discussed below.

3.2.1 Methods in Consumer Neuroscience

Consumer neuroscience utilises tools that allow for the quantitative evaluation of marketing stimuli (Harris, Ciorciari & Gountas, 2018). Marketing stimuli range from aspects such as brand images, advertising, pricing, or product packaging. The limitations of traditional market research such as the reliance on subjective self-reports or in-depth interviews to measure cognitive processes in response to marketing stimuli have been extensively studied (Harris, Ciorciari & Gountas, 2018). However, these methods tend to be very subjective, and they may not fully capture the consumers' emotional preferences.

Consumer neuroscience employs quantitative methodologies to measure subconscious preferences or decision making (Harris *et al.*, 2018). It employs a range of neuroscientific and physiological research tools to track changes in brain activity, aiming to gain insights into cognitive and emotional processes (Harris *et al.*, 2018). Bercea (2013) classified neuromarketing tools into three distinct categories based on their capacity to measure various types of brain or neural activity signals (Royo-Vela & Varga, 2022).

The first category consists of the changes in the metabolic activity which are measured using Functional Magnetic Resonance Imaging (fMRI), Magnetoencephalography (MEG), or Positron Emission Tomography (PET) (Harris, Ciorciari & Gountas, 2018; Royo-Vela & Varga, 2022). The second group involves devices that measure the changes in the electrical activity of the brain using multiple techniques such as EEG, MEG, SST or TMS (Harris, Ciorciari & Gountas, 2018). The most widely used tool in neuromarketing is the Electroencephalograph (EEG) (Royo-Vela & Varga, 2022). This technique is favoured in neuromarketing for its relative cost-effectiveness and the ability for the respondents to be mobile, unlike in fMRI (Royo-Vela & Varga, 2022). Another category consists of the physiological biometric measurement tools, which do not directly measure brain activity but are still pertinent to neural processes (Royo-Vela & Varga, 2022). This includes the Galvanic Skin Response (GSR), the heart rate (ECG), eye tracking technology, facial recognition (FAC) and implicit associations tests (Harris, Ciorciari & Gountas, 2018). These measures aim to analyse the reactions of the individuals by examining the body signals (Royo-Vela & Varga, 2022).

3.2.2 Metrics in Consumer Neuroscience

Moreover, one of the key distinctions of neuromarketing compared to traditional research techniques is the utilised metrics (Royo-Vela & Varga, 2022). The traditional measures often focus on verbal or written answers and the statistical measures to apply quantitative or qualitative analysis. In contrast, neuromarketing measures the physiological responses such as the brain waves, the heart rate, skin responses or eye tracking (Royo-Vela & Varga, 2022). Therefore, different metrics are employed for the various categories involved in the neuromarketing techniques. This research paper focused on the utilisation of eye tracking technology which records visual attention, and the eye movement patterns of the respondents are recorded by monitoring the reflections of light in the cornea and the centre of the pupil. Various measurements are used within the field of eye tracking and will be discussed in detail in the following section.

3.3 EYE TRACKING TECHNOLOGY

The adoption of eye tracking technology which serves as a non-intrusive and objective mechanism to capture the data related to visual attention to study both consumer behaviour and cognition has gained prominence as a favourable tool (Harris, Ciorciari & Gountas, 2018; Bercea, 2013). This technology has found notable application within the realm of consumer neuroscience in marketing, thereby enabling the investigation of how consumers process visual information (Fazio, Reitano & Loizzo, 2020). Eye tracking is defined as “an experimental tool utilised to record eye movements and gaze patterns, commonly used to measure consumers’ visual attention” (Carter & Luke, 2020). Most contemporary eye trackers use near-infrared technology combined with a high-resolution camera to monitor the direction of an individual's gaze (Farnsworth, 2017). The underlying concept utilised for eye tracking is referred to as Pupil Centre Corneal Reflection (PCCR) which involves the camera tracking the centre of the pupil, where lights reflects from the cornea (Farnsworth, 2017). Eye tracking is commonly employed to assess eye movements along with variations in pupil dilation and constriction (Harris, Ciorciari & Gountas, 2018); as well as to determine the direction of the gaze from an individual based on the position of the eye at a duration of time and its moving sequence, as well as different fixation duration (Huddleston *et al.*, 2018). Researchers have found that pupil dilation occurs when consumers respond positively to emotional stimuli, and the pupils contract when they are exposed to negative stimuli (Harris, Ciorciari & Gountas, 2018). Eye fixations engage specific brain regions to process the information gathered during these fixations (Huddleston *et al.*, 2018).

There are two types of devices in eye tracking, a screen-based eye tracker (otherwise known remote or desktop) or eye tracking glasses, which are mobile and can be worn by individuals (Farnsworth, 2017). A screen-based eye tracker was utilised for the

purpose of this investigation. A screen-based eye tracker is mounted onto a screen or computer and records the eye-movements from a distance (Farnsworth, 2017). On the other hand, with the mobile eye tracking glasses, the respondent physically wears the device and can move around with it. A screen-based eye tracker was the preferred device for this study as screen-based stimuli such as the images of the milk product packages rather than the physical packages, were tested. Additionally, the A/B testing task required each of the packages to be displayed next to one another, which is more efficiently carried out on a screen, especially considering that there were 90 iterations of these product packages shown.

Moreover, eye tracking research methods aim to measure consumers' visual attention, thus providing valuable insights into consumer behaviour. Attention is derived from two visual attention processes, namely: the top-down and the bottom-up attention. Top-down attention influences the consumer's selection based on past experiences, whereas the bottom-up attention captures an individual's attention through a given stimulus (Casado-Aranda & Sanchez-Fernandez, 2022). New age eye tracking technologies have been seen to provide moment-by-moment insights into attentional processes which allow researchers to evaluate the communication effectiveness and visual attention concerning their marketing stimuli, such as their advert or product (Casado-Aranda & Sanchez-Fernandez, 2022).

Eye tracking is growing more popular in research in marketing, due to its portability, ease of use, and cost-effectiveness (Huddleston *et al.*, 2018). It has made analysing consumer shopping behaviour and decision-making more straightforward and effective. Eye tracking technology has been utilised to investigate a variety of aspects of retail marketing, such as product packaging, in-store imagery or product labelling (Huddleston *et al.*, 2018). Despite the rise in online shopping, the retail store remains extremely important for consumers. Researchers are progressively adopting eye tracking technology to inform their understandings of consumer shopper behaviour in the real in-store environment (Huddleston *et al.*, 2018).

Over recent years, research has revealed the evolution and innovation of novel packaging across a diverse range of food and drink products, including the dynamic realm of fast-moving consumer goods products (Piqueras-Fiszman *et al.*, 2013). Researchers are working to innovate novel packaging formats to attempt to create a "multisensory" packaging experience for the consumer (Piqueras-Fiszman *et al.*, 2013). However, research also suggests that certain attributes contribute to the broader multi-sensory stimulus, by effectively conveying pictorial or descriptive information about the product (Piqueras-Fiszman *et al.*, 2013). Therefore, it is imperative to comprehend the diverse visual cues of product packaging and their implications on visual attention. This exploration was facilitated through the utilisation

of eye tracking technology and the integration of existing research to address the research question effectively.

3.3.1 Eye Tracking Metrics

Eye tracking metrics provide researchers with invaluable insights into how the respondents allocate their attention over time, thus offering observation and insights into cognitive processes (Casado-Aranda & Sanchez-Fernandez, 2022). The most important eye tracking metrics utilised are fixations, saccades, gaze duration, pupil dilation, smooth pursuit movement, the blink rate as well as the scan path (Casado-Aranda & Sanchez-Fernandez, 2022). However, the most prominent metrics utilised in eye tracking literature are fixations, gaze points and saccades. Gaze points serve as a fundamental unit of measurement (Farnsworth, 2017). A single gaze point is one raw sample captured by the eye tracker (Farnsworth, 2017). Since an eye tracker measures 60 times per second, each gaze point represents a 60th of a second (16.67 milliseconds) (Farnsworth, 2017). When a series of gaze points are close in time, they form a cluster, which indicates a fixation (Farnsworth, 2017).

A fixation is the duration during which our eyes are focused on an object or stimulus (Royo-Vela & Varga, 2022). During a fixation, the eye remains still for approximately 200 – 500 milliseconds (Motoki, Saito & Onuma, 2021), typically lasting between 100 – 300 milliseconds (Farnsworth, 2017). Consumers are known to extract detailed information during fixations, thus underscoring their importance in identifying different products while shopping (Motoki, Saito & Onuma, 2021).

The movements of the eye between fixations are known as saccades (Farnsworth, 2017), which represent the intervals between fixations, and show the movement of the eyes between one fixation to the next (Casado-Aranda & Sanchez-Fernandez, 2022). The saccades redirect attention, thus reducing visual perception and information processing until the eyes are still (Casado-Aranda & Sanchez-Fernandez, 2022).

The fixations are analysed individually using the Areas of Interest (AOI), with each element or visual cue having its own AOI (Motoki, Saito & Onuma, 2021). The AOIs are defined as “user defined sub-regions of a displayed stimulus” (Farnsworth, 2017) and the eye movements are assigned to a specific AOI to determine the amount of attention allocated to those regions. Metrics are then reported per AOI, thereby providing detailed insight into the allocation of attention (Motoki, Saito & Onuma, 2021).

Among these various eye tracking measures, the fixations are extensively used in consumer neuroscience studies (Motoki, Saito & Onuma, 2021). Fixation duration is commonly used to understand how the individuals perceive objects and AOIs (Tobii,

2023). Higher fixation durations indicate higher levels of interest, while lower fixation durations suggest that other objects or AOIs are more attention-grabbing (Tobii, 2023). Overall, the eye tracking movements can offer further insight into the unconscious processes collecting consumer attention (Carter & Luke, 2020). Common eye tracking metrics include the Fixation Count (N), average fixation duration, Total Fixation Duration (TFD) as well as Time to First Fixation (TTFF). For this study, metrics such as the TTFF, the TFD as well as Average Fixation Duration were assessed.

3.3.1.1 Time to First Fixation

The TTFF represents the duration it takes for a participant to respond to a given AOI (Farnsworth, 2017). This metric is valuable for analysing how quickly an individual's attention is captured (Tobii, 2023) and can reveal which aspects of the visual stimuli are prioritised in the minds of the respondent (Farnsworth, 2017). Due to the brain's limited capacity to process items, the objects or AOIs in the visual field are selected at the expense of others (Farnsworth, 2017). The analysis of scan paths often identifies elements that are fixated on first and frequently (Farnsworth, 2017). Textual elements or titles, imagery and paragraphs/headers are typically fixated on first and for longer than other elements on the product (Bylinskii, Borkin, Kim, Pfister, & Oliva, 2017). Research indicates that more time is spent reading textual elements than viewing imagery (Bylinskii *et al.*, 2017).

However, there are some limitations attached to the TTFF. The initial effect of this metric may be attributed to the visual design elements and the consumer's gaze may not be held to interest in the actual element (Casado-Aranda *et al.*, 2023). Stimuli that stand out in comparison to other visual elements grab the consumer's attention first, resulting in a lower TTFF.

3.3.1.2 Total Fixation Duration

The TFD is the cumulative duration of all fixations on a specific object or AOI and it is an important metric for understanding consumer attention (van der Laan *et al.*, 2015). It provides insight into which aspects of the visual stimulus the respondent visually attends to the most (Farnsworth, 2017). Research suggests that the stimuli that are preferred are typically viewed longer, thus indicating higher levels of processing (Casado-Aranda *et al.*, 2023). However, longer TFD may also indicate a level of confusion among the respondents (Casado-Aranda *et al.*, 2023).

3.3.1.3 Average Fixation Duration

Average fixation duration serves as a valuable tool to analyse complex stimuli or to measure engagement (Bylinskii *et al.*, 2017). Previous studies have shown that

objects of preference and choice tend to be observed for longer periods of time (Vriens *et al.*, 2020). According to Casado-Aranda *et al.* (2023), the average fixation duration can be used as a pivotal metric for advertising effectiveness. For instance, the higher the fixation is, the more complex the stimulus may be. The fixation durations shorter than 200 - 250ms are seen to be involuntary, whereas those exceeding 300ms are considered to be encoded in one's memory (Bylinskii *et al.*, 2017). Average fixation duration is typically longer for stimuli containing visually engaging elements such as infographics or scientific diagrams (Bylinskii *et al.*, 2017). The duration of fixations is dependent on the complexity and the difficulty of stimulus content as well as the task (Bylinskii *et al.*, 2017).

Overall, the eye tracking technology and the metrics utilised to measure the attention of the participants are crucial elements in this study. Following on from this section, the importance of sustainable consumption is examined.

3.4 SUSTAINABLE CONSUMPTION

Sustainable consumption is defined as “using products and services to meet an individual's basic needs and enhance the quality of life whilst minimising natural resource use, to ensure the well-being of future generations”, as defined by the Oslo Symposium (Lappeman *et al.*, 2021). While both the company and the consumer's approach to sustainability is vital, both are evolving in their own way (Lappeman *et al.*, 2021). A rising trend in sustainable consumerism has promoted reducing meat consumption in diets, and research has shown that a lot more South African consumers are opting for plant-based diets (Lappeman *et al.*, 2021). There are three pillars of sustainability, namely: social, economic or ethical and environmental sustainability (Purvis, Mao & Robinson, 2019). Social consumerism is whereby consumers utilise their purchasing power. Ethically conscious consumption is practised through the consumer's ethical considerations for a product. This may be purchasing products from the local farmers instead of from the large grocery stores (Lappeman *et al.*, 2021). Lastly, environmental consumption is practising the purchasing of goods that minimise the harm to the natural environment.

The Sustainable Developmental Goals or “SDG's” as proposed by the United Nations, is an extremely important framework utilised for sustainability (Ramutsindela & Mickler, 2020). With a collection of 17 goals which are designed to address challenges that are faced globally, these goals aim to address many shortfall that may arise globally. These goals were set in 2015 by the United Nations and hope to achieve these goals by 2030 (Lappeman *et al.*, 2021). Numerous organisations, both globally and locally, have realigned their business objectives according to the SDG's in order to become more eco-friendly and sustainable in their practises. In accordance to the SDGs, it can be argued that *OKJA* are working towards SDG number 12, which is responsible consumption and production, an important aspect to integrate into

research, specifically in South African. With a Gini coefficient of 0.63, research has shown that South Africa has one of the highest inequalities globally (Lappeman *et al.*, 2021). The high unemployment rate heavily contributes towards the inequality in the country, meaning it is crucial to take into account affordability and education levels concerning sustainability in South Africa. Additionally, it is evident that a large majority of South Africans do not perceive sustainable or plant-based diets as feasible options, which may impact their purchasing decisions. However, this perception may not necessarily affect their attentional processing, which therefore minimises the interference with the study.

In recent years, consumer concerns have been heightened regarding environmental sustainability, food safety as well as social justice issues (Migliore, 2021). These aspects have fostered new consumption practices focused on social, economic, and environmental sustainability (Migliore, 2021). The food preferences, choices, and eating habits are deemed to be relatively difficult to change, as they are a significant aspect of the consumers' lifestyles and their socio-cultural environment (Vermeir, Weijters, De Houwer, Geuens, Slabbinck, Spruyt, Van Kerckhove & Van Lippevelde, 2020). Many individuals have positive attitudes towards sustainable consumption habits, but there is a significant gap between these favourable attitudes and the actual purchase and consumption of environmentally friendly food products (Vermeir *et al.*, 2020). This paper aims to contribute towards the United Nations' SDG's which aspire to transform the world and aim to address various social, economic and environmental challenges (World Health Organisation, 2023). Specifically, this study aligns its focus with the goal of responsible consumption and production, aiming to cultivate sustainable consumption practices, particularly in the context of plant-based milk.

The research focused on the sustainable consumption habits of the individuals aged 18 to 27 years as the targeted set of individuals, along with comparing plant-based and non-plant-based consumers in this cohort. Recent research by Su, Tsai, Chen & Lv (2019) reveals a noteworthy shift in the consumption habits among the consumers in this age bracket. This is attributed to the heightened environmental awareness within this generation, thus prompting a realisation of the significance of adopting sustainable consumption practices (Su *et al.*, 2019). The individuals belonging to this cohort exhibit tendencies towards eco-friendly practices, prioritise healthy food decisions and aspire for an enhanced quality of life in comparison to the other generations (Su *et al.*, 2019). This distinction is further reflected in their purchasing behaviours and attitudes toward particular concepts, as evidenced by the research findings (Dragolea, Butnaru, Kot, Zamfir, Nuță, Cristea, & Ștefănică, 2023). Moreover, according to a McKinsey and Company article published in 2022 by Hattingh and Ramlakan, it was seen that the South African consumers expressed a keen interest in paying premium prices for healthy eating and sustainable purchases over the past two years (Hattingh & Ramlakan, 2022). Additionally, 51% of the consumers expressed a

preference for locally sourced products, which aligns with the utilisation of a South African oat milk product brand *OKJA* for this investigation.

Sustainable consumption is a critical aspect of modern consumer behaviour, encompassing social, economic and environmental considerations. This study aimed to focus on sustainable consumption in a South African context, however, it is important to take into account that factors such as affordability and education play a significant role in determining the feasibility of the sustainable plant-based diets. This study targeted individuals between 18 and 27 years, a cohort that is known for its heightened environmental awareness and inclination towards sustainable practises. Overall, this paper aimed to underscore the importance of sustainable consumption in addressing global challenges and it highlights the need for future research and action to promote sustainable lifestyles, particularly in the context of food consumption. The following section focuses on milk product packaging design, specifically focussing on which visual cues of sustainability are incorporated into the package.

3.5 PRODUCT PACKAGING DESIGN

3.5.1 Package Design

A growing body of research indicates that consumers are subtly influenced by unconscious cues within the retail environment (Van Ooijen *et al.*, 2017). While much research has primarily examined the effects of retail atmospherics - such as sounds, displays, and scents—on consumer behaviour, the influence of product packaging design has recently become a significant area of study (Van Ooijen *et al.*, 2017). Product packaging design is crucial for brands as it enables them to capture consumers' attention at the point of sale. There have been numerous studies suggesting how the individual packaging cues influence consumer perceptions and the expectations of several attributes (Van Ooijen *et al.*, 2017). Visual cues such as the colour, shape or material are key elements that have been extensively studied. However, there are limited studies examining how subtle package design cues such as explicit product information influences consumer behaviour (Van Ooijen *et al.*, 2017). Therefore, understanding the effects of both explicit and implicit products attributes is essential for brands seeking to influence consumer behaviour.

The consumer's expectations of the products they consume are influenced by various factors. Researchers have identified that product attributes closely related to food choice motives fall into two categories: extrinsic or intrinsic product factors (Salnikova & Grunert, 2020). Extrinsic factors include information sources related to the product, such as the packaging, labelling, marketing information or where it may be sold (Piqueras-Fiszman & Spence, 2015). On the other hand, product intrinsic information pertains to elements that physically belong to the product (Piqueras-Fiszman & Spence, 2015).

3.5.2 Intrinsic Product Packaging Attributes

Intrinsic product attributes refer to the physical characteristics of a product that cannot be modified without altering the physical characteristics of the product itself (Piqueras-Fiszman & Spence, 2015). These attributes comprise of nutritional composition, ingredients, aromas or the taste of the product (Hoffmann, Symmank, Mai, Stok, Rohm, & Hoffmann, 2020). Numerous studies suggest that the interplay between intrinsic and extrinsic visual cues is essential in shaping consumer preferences (Salnikova & Grunert, 2020). Despite the abundance of research of various extrinsic and intrinsic cues, consumers are bound to face a trade-off decision, weighing various characteristics to achieve the highest utility or benefit for them (Salnikova & Grunert, 2020). While there is a vast body of literature on the intrinsic properties of food products, this research paper solely focused on the extrinsic product attributes. This choice was driven by the study's emphasis on various visual cues related to sustainability that impact the consumer's decision-making and preferences.

3.5.3 Extrinsic Product Packaging Attributes

The extrinsic product attributes are crucial from a marketing perspective as they enhance the appeal of food products and drive purchases without modifying the product's inherent characteristics (Hoffmann *et al.*, 2020). This aspect is particularly relevant for marketing practitioners, as the packaging can be altered to align with consumers' demands and preferences without changing the product itself (Hoffmann *et al.*, 2020). Food choice is a fundamental topic in marketing and consumer behaviour studies, with recent research focussing extensively on the food-decision-making processes and how consumers make their various food choices (Hoffmann *et al.*, 2020). Similarly, there is a heightened interest in comprehending the drivers behind the consumer motivations and preferences regarding food product selection and purchases.

The extrinsic product attributes are sources of information that are related to the product, such as branding or logos (Piqueras-Fiszman & Spence, 2015), whereas the intrinsic product attributes pertain to the physical contents of the product itself, such as the milk (Piqueras-Fiszman & Spence, 2015). Previous research has highlighted several extrinsic attributes that influence the consumer's purchase decisions, thus emphasising their significance for marketing practitioners in shaping consumer buyer behaviours (Hoffmann *et al.*, 2020). For example, consumers often assess product quality based on branding or labelling (Hoffmann *et al.*, 2020). Therefore, this paper exclusively focused on employing the extrinsic attributes associated with the sustainable visual cues, specifically addressing the explicit and implicit visual cues that aim to communicate sustainability, drawing from the Cue Utilisation Theory where these cues have been adapted from.

3.5.3 Cue Utilisation Theory (CUT)

The Cue Utilisation Theory framework was developed by Easterbrook in 1959, and it suggests that consumers use a combination of cues associated with their beliefs, which influence their behaviour particularly with more complex products (Liem, Groen & van Kleef, 2022). According to this theory, the cues can be divided in terms of structural, visual, information on environmental impact as well as the sensory cues (Herbes *et al.*, 2022). In the context of packaging cues, the cues can be implicitly or explicitly related to sustainability: explicit pertaining to the information on environmental impact; and implicit pertaining to the structural or visual cues. This study focused on the environmental informational cues and visual cues.

Many studies have explored how consumers recognize sustainable or environmentally friendly packaging cues. For example, Scott and Vigar-Ellis (2014) conducted a study with 350 respondents, administering a questionnaire through Facebook in South Africa. The questions concentrated on how respondents differentiate environmentally friendly packaging (Scott & Vigar-Ellis, 2014). The results revealed that 44% of the respondents relied on labelling, while 30% of them based their judgements on the logo on the packaging (Scott & Vigar-Ellis, 2014). This indicates that most respondents derived their answers from the visual cues on the product packaging (Herbes *et al.*, 2022). In contrast, only a small number of respondents based their answers on the colour of the packaging (Herbes *et al.*, 2022). These respondents perceived natural colours such as brown and green as being more environmentally friendly (Scott & Vigar-Ellis, 2014). Additionally, they associated sustainability with packaging that used less ink or colour (Scott & Vigar-Ellis, 2014). The following section discusses implicit and explicit product packaging cues in more depth.

3.5.4 Implicit Product Attributes: Background Colour and Iconography

Relevant literature suggests that there are various approaches to classifying extrinsic product packaging design elements. One such approach is classifying elements based on whether they convey implicit or explicit product information (Festila & Chrysochou, 2018). The design cues are argued to be implicit when they are not recognised deliberately, however, they “make sense” to the consumers when they are utilised in the correct setting (Van Ooijen *et al.*, 2017).

Implicit sustainable visual cues are believed to cultivate a sense of sustainability among consumers without directly stating it on the package (Liem, Groen & van Kleef, 2022). The implicit packaging design elements include factors such as imagery/aesthetic cues, colour, icons, packaging format, or the materials that are easily associated with sustainability for consumers (Liem, Groen & van Kleef, 2022). For this investigation, only two implicit attributes were tested on a South African plant-based milk product *OKJA*: namely the background colour and imagery, focusing on

sustainability icons, as existing research suggests that these two elements are particularly effective. Moreover, these two elements are seen to grab consumers attention the most, as supported by the literature from García-Madariaga, Blasco López, Burgos, & Virto (2019).

Colour is a crucial cue in marketing, and it is known for capturing consumers' attention extensively (García-Madariaga *et al.*, 2019). While it is widely acknowledged that colour plays a significant role in packaging, there are gaps in research in understanding its real impact on consumer attention (García-Madariaga *et al.*, 2019). Implicit package design characterised by a "natural" appearance is believed to inherently convey notions of sustainability to a considerable number of consumers (Granato *et al.*, 2022; Liem, Groen & van Kleef, 2022). Green, for example, is commonly associated with nature, environmentally conscious consumption, sustainability, and a healthy lifestyle. Research also indicates that sustainable products are commonly associated with dull colours such as greens, browns, and whites (Vermeir & Roose, 2020).

Colour can also influence perceptions of healthiness (Vermeir & Roose, 2020). Tijssen, Zandstra, de Graaf, & Jager (2017) found that individuals associate "less vibrant" and "watered down" packaging colours with healthiness (Tijssen *et al.*, 2017). Beyond capturing attention, colour can communicate a sense of "naturalness" and sustainability (Vermeir & Roose, 2020). Specific colours are known to convey meanings, which are reinforced through repeated exposure to colour and associative learning (Vermeir & Roose, 2020). Furthermore, colours are frequently used to draw consumer attention towards important objects on product packaging (Vermeir & Roose, 2020).

While colour can impact expectations about the product, there is limited research on how the colour of plant-based milk product packaging colour affects the perception of sustainability (Liem, Groen & van Kleef, 2022). For this study, only three colours were utilised to modify the control's product packaging, which is a South African oat milk brand, OKJA. Based on the research, the chosen colours for this study were "natural", "dull" and "less vibrant" colours such as green, beige/yellow and a grey/brown package, as suggested by Vermeir and Roose (2020) as well as by Tijssen *et al.* (2017). As research suggests, green is seen to be a more visually salient colour compared to brown and beige (Ischen *et al.*, 2022), thus impacting the hypotheses generated for the study.

Additionally, the pictorial elements on product packaging are considered as key elements for a consumer when selecting products from a shelf (García-Madariaga *et al.*, 2019). Research has explored how imagery may shape the expectations of product attributes, even in the presence of textual information (Llavata, García-Pérez, Simal, & Cárcel, 2020). In accordance to Pieters and Wedel (2004), images are often the

primary element used to capture the consumers' attention. Visually striking images can immediately draw the consumer's focus, while requiring less cognitive effort compared to text, thus potentially fostering expectations (Llavata *et al.*, 2020). As a result, imagery may outweigh or compete with the information conveyed by textual cues (Llavata *et al.*, 2020). The visual elements of product packaging play a crucial role in capturing the consumer's initial attentional processes at the point-of-purchase, which can positively impact the overall brand recall (García-Madariaga *et al.*, 2019).

Numerous eye tracking studies have explored the influence of images on consumer attention, thereby revealing that the products with pictorial elements on them are more likely to attract the consumer's attention (García-Madariaga *et al.*, 2019). This study investigated the use of iconography, particularly those associated with sustainability on plant-based milk packaging. Common icons in the market include the universally recognised "V" for vegan, the widely used recycling symbol, as well as the "FSC" emblem, as outlined in **Appendix B**, Figure 2.1 – 2.3. These icons were integrated into OKJA's packaging alongside colour as an additional design modification. While these icons are typically situated on the rear of product packaging, they were featured on the front of the package for this study to assess how this placement influences the consumer's attention and their perception of the product's sustainability.

3.5.5 Explicit Product Attributes on Plant-Based Milk Product Packaging

While the implicit cues are believed to influence through associative and inferential routes, explicit cues are perceived to establish associations through an informational belief route (Granato *et al.*, 2022). Therefore, informational, and verbal statements on the product package are categorised as explicit visual cues, as they are perceived as directly conveying the packaging's environmentally friendly features (Granato *et al.*, 2022). The explicit visual cues include elements such as marketing messages or textual claims (Liem *et al.*, 2022). For this investigation, various textual cues on plant-based milk product packaging were analysed. Research has shown that consumers who are deeply engaged in their purchase decisions evaluate textual information more thoughtfully and thus rely more heavily on product packaging messaging to shape their purchase intentions (García-Madariaga *et al.*, 2019). Consumers are seen to use explicit cues to form beliefs about the sustainability of the produced package, through a more deliberate and cognitive decision-making process (Granato *et al.*, 2022).

Research has further demonstrated that the textual information on product packaging can capture consumers' attention more effectively than the packaging without text. Textual cues can be divided into two categories; namely informative and interpretive (López-Mas, Claret, Bermúdez, Llauger, & Guerrero, 2022). The informative claims are seen to provide impartial or objective information (such as nutritional information); whereas the interpretive claims provide information with some sort of processing

(López-Mas *et al.*, 2022). Therefore, the textual information that was modified on the packaging was based on the interpretive claims. The textual claims that were placed on OJKA's milk products were based on the current plant-based milk products in the South African marketplace, which can be found in **Appendix B**, Figure 2.4. Thus, the textual claims included: "Plant-Based", "Vegan" and "Dairy-Free". The reason for including these claims on the packaging modifications was to consequently assess how these changes will impact consumer attention and their perception of sustainability.

3.6 VISUAL ATTENTION

Attracting consumer attention is a pertinent objective in marketing. One effective method for assessing visual attention is through the utilisation of eye tracking technology (Daugherty & Hoffman, 2018). Fixations offer valuable insights regarding salient features of visual stimuli (Daugherty & Hoffman, 2018). Neuromarketing studies aim to uncover unconscious factors that influence the consumer's perceptions of diverse stimuli, with a central emphasis of these studies often revolving around visual attention (Boscolo *et al.*, 2021). Attention involves the capacity for the selective control of limited cognitive resources (Lindsay, 2020). This process involves a sequential pattern comprising of fixations and saccades (Husić-Mehmedović *et al.*, 2017). Visual attention is paramount for consumers to gather information about a product. Orquin and Loose (2013) highlight its pivotal role in decision-making as it enhances visual processing and alters consumer perception (Ladeira *et al.*, 2019).

According to Awh, Belopolsky, and Theeuwes (2010), visual attention is influenced by both the top-down and bottom-up processes as well as by various other factors such as the selection history or mere exposure effect (Vriens, Vidden & Schomaker, 2020). Bottom-up attention is a more involuntary process, whereby consumers are influenced by stimuli in the external environment (Ladeira *et al.*, 2019; Schütt, *et al.*, 2018). In contrast, the top-down attention stems from long-term visual memory and it is considered to be more of a voluntary process that guides visual attention based on the consumer's goals triggered by a given stimulus (Ladeira *et al.*, 2019). Both these attentional processes can directly affect consumer choice, or indirectly affect choice through attention (Vriens, Vidden & Schomaker, 2020).

Consumers may not always focus on all the information provided on food product packaging, labelling, or in-store displays. Therefore, it can be assumed that the information or the visual cues on product packaging can influence consumers' food choices and preferences only if they manage to capture their attention (Van Loo *et al.*, 2018). Attention allows the individuals to selectively use information, assisting them in their decision-making process (Van Loo *et al.*, 2018). Moreover, there is a wealth of research on visual attention that emphasises the link between visual saliency and

fixation durations (Clement *et al.*, 2015), thus highlighting the significant importance of visual saliency in the domain of visual attention.

3.6.1 Visual Saliency

Saliency is a concept that is frequently discussed in the context of visual attention (Schütt, *et al.*, 2019). Visual saliency can be described as the perceptual characteristics that differentiate certain elements from their surroundings, ultimately capturing an individual's attention (Berga & Otazu, 2022). Visual saliency can be assessed using computational models of visual attention and can be manipulated by changing various stimuli, such as contrast, colours, size or the orientation relative to the background (Vriens *et al.*, 2020). For quick responses and an increased cognitive load, visual saliency is seen to predict consumer choice better, especially when no strong preference exists (Vriens *et al.*, 2020).

Furthermore, saliency is seen to become synonymous with the bottom-up eye movements and attention due to earlier research models focussing on fixation location predictions (Schütt, *et al.*, 2018). Schütt *et al.* (2018) described the saliency model as a bottom-up model that predicts fixation locations for a given image, irrespective of complex features. Despite inconsistent terminology, the eye movements can clarify the interplay of the bottom-up and the top-down factors. Visual attention is drawn to elements that stand out from surroundings, such as a contrast in colour, intensity or movements (Milutinović, Ahonen-Jonnarth, & Seipel, 2021). This visual attraction is described as bottom-up visual attention, where attention is purely driven by sensory factors and it is unrelated to the relevance of the salient object (Milutinović *et al.*, 2021). Past research has suggested, however, that the top-down should be considered additionally. Whilst there is a general consensus that both the bottom-up and top-down attention influences attentional selection, their extent of influence is debated (Milutinović *et al.*, 2021). Saliency is important for a short period of time, and it is then overridden by the top-down control, thus retaining information about object presence rather than visual salience (Milutinović, *et al.*, 2021). It is therefore critical to take visual saliency into account when analysing visual attentional processes. As such, there are elements on product packages that may be more visual salient than others, which is important to consider when analysing the results.

3.6.2 Bottom-Up and Top-Down Visual Attention

There are two processes that govern visual attention, namely the bottom-up and the top-down attention. Bottom-up attention is generally known as “exogenous” attention, and the factors that influence attention include various aspects such as position, contrast, colours, brightness, surface, position, size and symmetry (Vriens, Vidden & Schomaker, 2020; Motoki, Saito & Onuma, 2021). For instance, products that are

presented on the same shelf will draw more attention if displayed more attractively compared to those that are not properly exposed (Ladeira *et al.*, 2019; Schütt, *et al.*, 2018). This occurs involuntarily, which is deemed as bottom-up attentional processing (Ladeira *et al.*, 2019). From this, Vriens, Vidden and Schomaker (2020) concluded that bottom-up factors influence the visual salience of an object in relation to its background or nearby products. In essence, bottom-up attentional processing was used by the consumers in one of the tasks in the experiment, whereby no prompt was shown. Bottom-up factors refer to stimuli features that attract fixations, independent of the individual's internal state (Shutt *et al.*, 2018). Different aspects of various stimuli can capture consumers' attention despite their having the ability to direct attention; which thus results in the application of the bottom-up control over attention (Casado-Aranda & Sanchez-Fernandez, 2022).

Top-down attention is referred to as "endogenous", and it is defined as voluntary or goal-directed attention, allocated toward a given stimulus. The factors affecting top-down attention range from but are not limited to aspects such as product characteristics, consumer goals, knowledge, as well as emotion or task instruction (Motoki, Saito & Onuma, 2021; Vriens, Vidden & Schomaker, 2020). Top-down attentional factors are formed by variables that derive from long-term visual memory (Ladeira *et al.*, 2019). This attentional bias enhances the perceptual focus on specific properties of a product and can guide a consumer's attention toward particular features (Vriens, Vidden & Schomaker, 2020). Top-down factors can consequently be denoted in terms of a person's traits and characteristics (Ladeira *et al.*, 2019). This denotes that the top-down attention relies on an individual's prior knowledge or experience triggered by a given stimulus, involving more voluntary forms of allocation of attention (Ladeira *et al.*, 2019). In essence, the top-down attention was utilised as another task in this investigation, as the respondents were given stimuli whereby they directed their attention based on the task at hand.

3.7 HYPOTHESES

Based on the above research, the following hypotheses were created based on the research objectives:

H1a: *The background colours which result in more visually salient products (green) will produce lower Time to First Fixations (TFFF) than the colours that are not visually salient (blue, brown, beige).*

H1b: *The background colours which result in more visually salient products (green) will produce higher total fixation durations than the colours that are not visually salient (blue, brown, beige).*

H1c: *The sustainability icon including the recycle logo will produce significantly higher total fixation durations than the other icons (Vegan and FSC icons).*

H1d: *The TTFP will be lower for the sustainability icons than the other AOs on the packaging such as the textual elements.*

H1e: *The textual elements will generate higher total fixation durations than the other packaging elements such as the icons.*

H2a: *The product packaging including the sustainability icons will be perceived as being more sustainable than the product packing without.*

H2b: *The product packaging including sustainability text will be perceived as being more sustainable than the product packing without.*

H3a: *There is a positive relationship between the level of attention generated by the sustainability cues (TTFP and TFD) and the consumers' perception of sustainability.*

H3b: *The presence of colour will have a positive impact on the consumers' perception of sustainability.*

H3c: *The inclusion of the sustainability icons will positively influence the consumers' perception of sustainability.*

H3d: *The textual elements will positively influence the consumers' perception of sustainability.*

H4a: *The average fixation durations on the packs of the individuals who consume plant-based milk will be significantly higher when observing various plant-based milk product packaging in comparison to those who do not consume plant-based milk.*

H4b: *The average fixation durations on the packs of the individuals who consume plant-based milk will be significantly higher when observing sustainable visual cues.*

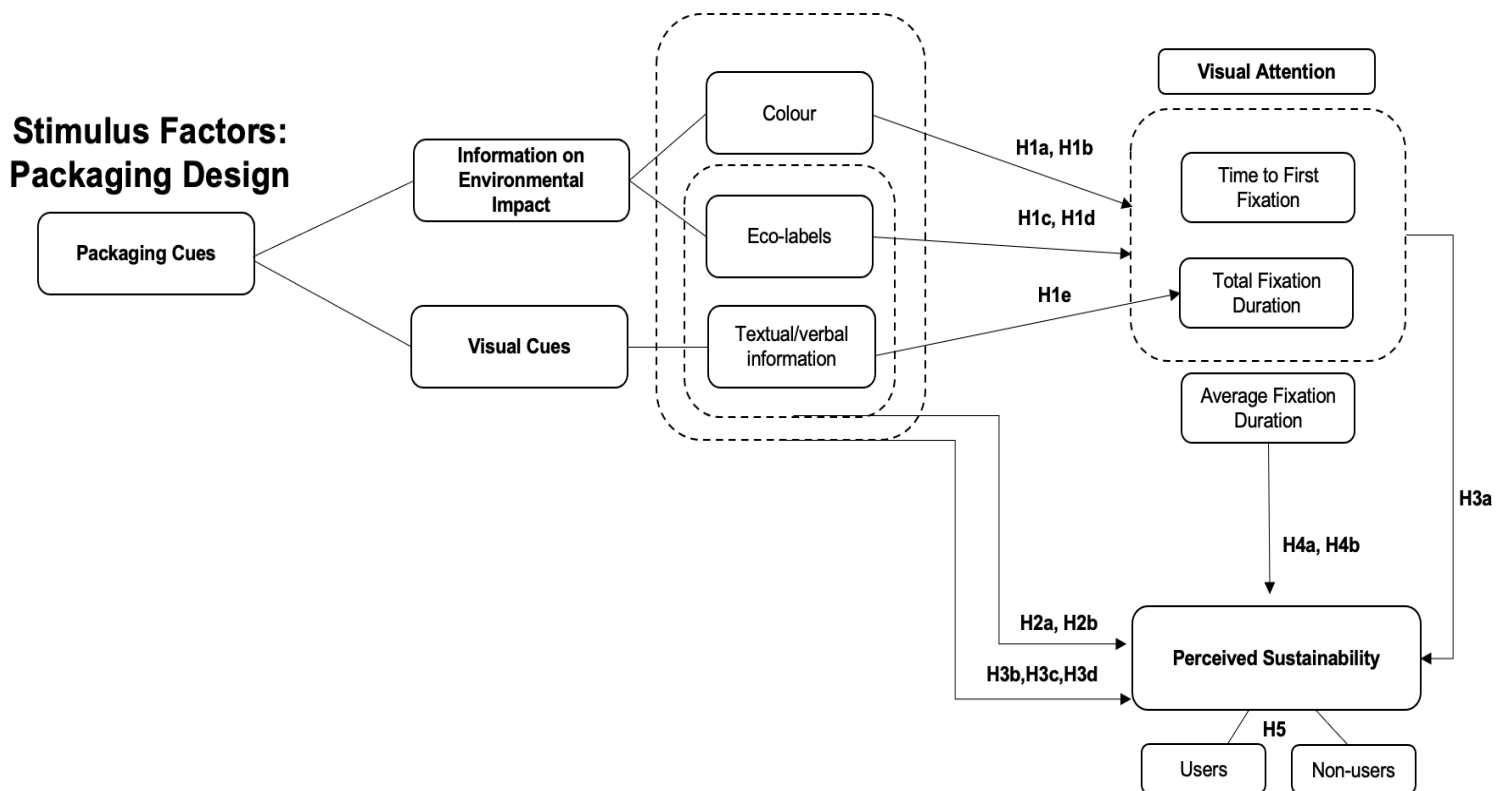
H5: *There will be a significant difference in the perception of product sustainability between plant-based milk drinkers and non-drinkers, with plant-based milk drinkers perceiving products with visual cues as more sustainable.*

3.8 CONCEPTUAL FRAMEWORK

The diagram by Herbes *et al.* (2020)'s theoretical framework depicts the Cue Utilisation Framework, which forms a basis of the theoretical framework of this study. This theory is a psychological theory that explains how the individuals use cues from their environment to make decisions and guide their behaviour (Herbes *et al.*, 2020). In this study, the conceptual framework integrates two specific cues which are the visual cues and information regarding the environmental impact. The second theoretical framework that the conceptual framework integrates is the visual attention model created by Casado-Aranda *et al.* (2023). This framework illustrates the visual attention processes, which are central to the study and are thus adapted in the conceptual framework.

The diagram below depicts the conceptual framework which has been derived from the two frameworks mentioned in Chapter 2. The stimulus factors are based on the CUT and pertain to the packaging designs in this study. From this framework, two cues are utilised. The visual cues such as colour and the eco labels, as well as the information of the environmental impact such as textual or verbal information. Additionally, the conceptual framework includes the visual attention metrics which are derived from Casado-Aranda *et al.* (2023). These metrics encompass time to first fixation, average fixation duration as well as the total fixation duration. The hypotheses that are being tested are also depicted in the conceptual diagram.

Figure 3: Conceptual Framework adapted from Casado-Aranda *et al.* (2023) and Herbes *et al.* (2020)



3.8 CONCLUSION

In conclusion, the literature review is instrumental in deepening the understanding of existing research that is pertinent to the topic at hand. It not only summarises the key findings from the past studies, but it also elucidates the constructs in the theoretical frameworks, thus highlighting their significance.

The literature review commences by delving into consumer neuroscience and neuromarketing holistically, by aiming to deepen the understanding of this

methodology that is employed in marketing. Consumer neuroscience is a crucial facet that has gained traction over the recent years, and amalgamates techniques from marketing, psychology and neuroscience to address limitations of traditional research methods, such as subjective self-reporting techniques. Neuromarketing, a key tool in consumer neuroscience, helps researchers understand how consumers react both consciously and unconsciously to marketing stimuli.

Furthermore, the review extensively discusses the metrics and methods of consumer neuroscience, notably emphasising the primary tool that was employed for this paper: eye tracking technology. Subsequently, a thorough examination of the eye tracking technology was discussed in depth, elucidating the distinctions between the different tools that are commonly utilised. For this research, the screen-based eye tracking technology was the type of eye tracking that was used. Moreover, the eye tracking metrics were then explored, detailing the metrics that were used for this study. Thus, the TTF, the TFD and the average fixation durations were employed for this study.

Building upon this foundation, the review underscores the significance of sustainable consumption, emphasising its pivotal role in the global contemporary landscape. This highlights the necessity for thorough investigation and research. Consequently, the target group of individuals was identified, since younger generations exhibit greater openness to modifying their habits as well as behaviours, and embrace sustainable practises into their daily routines.

The review proceeded to delve into product packaging design, whereby the distinction between extrinsic and intrinsic packaging design was elaborated upon. For the purpose of this study, the primary focus was on investigating extrinsic product attributes. Additionally, the implicit and explicit attributes were discussed, depicting the difference between these two aspects on product packages.

Furthermore, the review meticulously examined visual attention, which served as the central focus of this study within the context of eye tracking. The discussion delved into visual saliency as well as the bottom-up and top-down attention. Lastly, the conceptual model offered a structured framework for the study, providing a roadmap for subsequent exploration and analysis. The next chapter outlines the methodology, whereby the specific experimental designs and techniques are outlined.

CHAPTER 4: METHODOLOGY

4.1 INTRODUCTION

The research methodology is outlined in this chapter, uncovering key concepts such as the research philosophy, the research strategy and design, sampling techniques, data collection procedures as well as the measurement instruments. Additionally, the steps for data analysis are detailed along with the ethical considerations implemented to conduct the experiment, thus ensuring that the study adheres to all the required ethical criteria.

4.2 THE RESEARCH PHILOSOPHY

Research philosophies include theories about the nature of reality being studied (ontology) and the methods used to generate and validate knowledge about that reality (epistemology) (Dawadi, Shrestha & Giri, 2021). The researchers' activities are guided by basic sets of principles, which form part of a paradigm (Dawadi, Shrestha & Giri, 2021). A paradigm is the philosophical position concerning the truth of reality under a research problem (Dawadi, Shrestha & Giri, 2021). Therefore, the researchers' beliefs lead them to implement a quantitative, qualitative or a mixed methods approach for their study (Desai, 2017). Moreover, there are various approaches to research, with the popular research paradigms including positivism, interpretivism as well as constructivism (Abdul & Alharthi, 2016).

Positivism assumes that reality exists independently of human perception (Abdul & Alharthi, 2016). It is closely related to quantitative data analysis and has been the primary research method utilised in the past (Dawadi, Shrestha & Giri, 2021). This method follows an objective approach, whereby knowledge is gained through verifiable facts utilising quantitative statistics (Dawadi, Shrestha & Giri, 2021).

In contrast, the interpretivism and constructivism research paradigms are often employed in qualitative research (Dawadi, Shrestha & Giri, 2021). Interpretivism uses qualitative methods such as interviews and focus groups to subjectively analyse the participants, or to analyse social phenomena (Dawadi, Shrestha & Giri, 2021). Constructivism, on the other hand, is an alternative paradigm that posits knowledge as being actively constructed through human interaction in the real world (Dawadi, Shrestha & Giri, 2021). Unlike positivism, constructivism does not adhere to a singular methodology, but it is based on the process involved in knowledge generation (Dawadi, Shrestha & Giri, 2021).

Moreover, a mixed methods approach adopts a pragmatic paradigm, which encompasses the use of induction, deduction, as well as abduction. Induction involves discovering patterns, while deductions involve testing theories and hypotheses.

Abduction involves uncovering the best set of explanations for results. Therefore, this paradigm integrates both the subjective and objective knowledge to achieve the research objectives (Dawadi, Shrestha & Giri, 2021). Overall, this research study adhered to a pragmatic research paradigm, as a mixed-method research approach was deemed as the most appropriate and it is further discussed in the following section.

4.3 THE RESEARCH STRATEGY AND DESIGN

The research design serves as a framework that outlines specific procedures and details for conducting research to address the research problems as well as the objectives (Nunan, Birks & Malhotra, 2020). This paper adopted an exploratory research design, aiming to provide insights and explore problems that are not clearly defined (Malhotra, 2010). This study sought to determine the impact of the sustainable visual cues on milk product packaging and their influence on consumer attention, with eye tracking technology as the primary tool for measuring the consumer attentional processes.

Since this study employed a mixed method approach, it integrated quantitative empirical methods to measure unconscious responses to stimuli with qualitative approaches to evaluate conscious responses (Harris, Ciorciari & Gountas, 2018). Quantitative research focusses on measuring and quantifying data through the use of statistical analysis, while qualitative research seeks to gain a more in-depth understanding of the topics under investigation (Malhotra, 2010; Malhotra, Nunan & Birks, 2017). Employing both methods can help to provide greater clarity to the results of quantitative research, and the two approaches often complement each other (Malhotra, 2010). Bercea (2013) suggests that while each analysis has its limitations, combining both can lead to a more comprehensive investigation.

The quantitative component of this paper involved an eye tracking experiment, following a conclusive, causal research design, since the objective was to explain the cause-and-effect relationships between the visual cues that communicate sustainability and attention (Malhotra, Nunan & Birks, 2017). Causal research entails manipulating independent variables within a controlled environment (Malhotra, 2010). The causal research designs thus aim to seek whether specific treatments cause a certain outcome (Creswell, 2014; Malhotra, Nunan & Birks, 2017). The study was conducted in a small room with minimal distractions, under standard lighting conditions in the Menzies building at the University of Cape Town. Various timeslots were uploaded for the students to sign-up for their preferred time.

Before the study began, the participants underwent a screening process to determine their eligibility based on the study criteria, and whether they were consumers of plant-based milk, which is shown in **Appendix C**. Every participant was seated 65-70cm

from the eye tracker and screen. After a 9-point calibration of the eye tracker, the general instructions for the task were displayed on the screen for 5000-10000ms prior to each task (Piqueras-Fiszman *et al.*, 2013). A cross-hair or “central-fixation bias” was shown before each package for 1000ms, followed by the product package which was shown for a given time dependent on the task.

4.3.1 Task 1

The first task included a flash exposure of the packages, where the participants were shown the packages for a very short period of time. This was conducted due to research that has previously been conducted by Neural Sense in past studies and experiments.

4.3.2 Task 2

The second task instructions read: “An image of a milk product package will appear on the screen for 2.5s. Please look at it and then follow the task instructions presented on the screen thereafter. A total of 10 images will appear individually”. These packages are shown in **Appendix D**, Figure 3.1 – Figure 3.3 and varied orthogonally in terms of colours, various icons, as well as textual claims. After the task instructions were provided, a white screen with the cross-hair was shown for 1000ms. The product packages were presented for 2500ms each individually since on average, research indicates that this is the typical amount of time consumers spend looking at a package on a grocery store shelf (Piqueras-Fiszman & Spence, 2012).

4.3.3 Task 3

For the third task, the participants were directed to complete a word association task for the product packages. They were instructed to verbally express one word out loud that described their impression of the package. The participants were encouraged to use any adjective or word that first came to mind, thus allowing for the repetition of the same word if necessary. The word association task was based on research conducted by Piqueras-Fiszman *et al.* (2013), as well as the experiments that have been conducted by Neural Sense.

4.3.4 Task 4

Following on from the word association task, the participants were presented with the fourth task which prompted them on screen to choose which package they perceive to be more sustainable between two packages shown on the screen. This task followed an A/B format, where the respondents selected the package they perceived to be more sustainable by pressing the left or the right arrow key on the laptop. Each package remained on the screen until the respondents made a selection, thus

ensuring ample time for decision making. This process was repeated until each package was displayed alongside its counterpart in the category, comparing color, icons, and textual claims, respectively, thereby resulting in a total of 90 slides with two milk product packages each. This set up is shown in a table in **Appendix E**, Figure 4.1.

4.3.5 Qualitative Component

Qualitative research is defined as an in-depth investigation of how the participants in a study respond to the given questions in the study, thus aiding in understanding their perceptions, emotions and decision-making process (Bercea, 2013). The qualitative approach of this study involved collecting non-numerical data that was consequently analysed through interpretation and observations (Bercea, 2013).

After the experiment, participants were involved in a short interview focussing on their perception of sustainability. Firstly, a sorting task was carried out, and this was inspired by the research conducted by Liem, Groen and van Kleef (2022). The participants were asked to categorise the packages into three groups of perceived sustainability (least, medium and most) (Liem, Groen & Van Kleef, 2022). The packages were displayed in these three formats according to colours, icons and textual elements. The participants were required to sort these three groups of product packages into the three groups of perceived sustainability and provide justification for their answers.

Additionally, the respondents were to choose which package they perceived as being the most and least sustainable, providing reasons for their choices. They were also prompted to identify which elements or aspects of the package stood out the most to them as being sustainable. Lastly, the participants were asked whether they believe being a plant-based/non-plant-based milk consumer influenced their decisions for sustainability. This question aimed to determine if the plant-based milk drinkers had different perceptions of sustainability compared to the non-plant-based milk drinkers. Overall, the entire experiment lasted around 15-20 minutes and as a token of appreciation, the respondents were offered a Fizzer of their choice at the end of the session as a token of appreciation.

4.4 SAMPLING

The following section details the sampling procedures utilised for the study including the target population, the sampling method, the sample size as well as the sample frame.

4.4.1 Target Population

The target population is regarded as the group of individuals within a defined geographical region from which data is collected, thus allowing for inferences to be drawn based on the information gathered (Nunan, Birks & Malhotra, 2020). Alvi (2016) defines a target population as “all respondents who meet specific requirements for an investigation” (Willie, 2022). The target set of individuals for this study consisted of individuals between the ages of 18 to 27 years old residing in Cape Town. This age group was chosen since their purchasing behaviours and attitudes towards specific concepts are well reflected in this particular cohort. Moreover, they are more willing to adapt their consumption habits than the other generations (Dragolea *et al.*, 2023). This age group was further chosen due to their growing interest in sustainability and plant-based products, as indicated by the recent literature by Su *et al.* (2019). The participants were further advised to live in the metropolitan area since the experimentation process was carried out at the University of Cape Town. Moreover, within this defined target population, two groups were investigated: the plant-based milk drinkers versus the non-plant-based milk drinkers.

4.4.2 Sampling Method

Sampling involves choosing a subset from a larger group of individuals, thereby enabling the researchers to draw conclusions and make inferences about the entire population (Bhardwaj, 2019). The sampling method utilised for the purpose of this study was non-probability sampling. In this scenario, the likelihood of each member of the population being selected for the sample is unknown (Bhardwaj, 2019). There are various types of non-probability sampling techniques, however, the chosen technique was convenience sampling.

This type of sampling aims to find a sample based on of their convenient accessibility (Bhardwaj, 2019). Therefore, the participants were selected according to their availability and willingness to take part in the study. Typically, this type of sampling is favoured amongst the researchers as it is inexpensive and more accessible compared to the other sampling techniques (Taherdoost, 2018; Nunan, Birks & Malhotra, 2020).

The sample was acquired through the University of Cape Town database, via the UCT DSA mailing list, as well as by-word of mouth and social media platforms such as Instagram and WhatsApp. A list of willing participants was compiled using google sheets, where the participants entered their names and email addresses in an available timeslot for the eye tracking schedule. Participation in this study was completely voluntary and the results were kept anonymous. The participants had the option to leave the experiment at any point if they felt uncomfortable with proceeding, which was outlined in the consent form which they were required to sign before proceeding. This consent form can be seen in **Appendix I**.

4.4.3 Sample Size

A sample size denotes the total number of participants chosen for a study (Nunan, Birks & Malhotra, 2017). Determining the sample size is a critical aspect for the research process and it depends on the research design: a complex model with many variables requires a larger dataset compared to a simpler model (Memon, Ting, Cheah, Thurasamy, Chuah, & Cham, 2020). Previous research has provided recommendations for the minimum sample sizes required to conduct specific analyses (Memon *et al.*, 2020). For example, exploratory factor analysis requires more than 50 respondents, simple regression requires at least 50 individuals and generally 100 respondents are required for other research situations.

Due to the complex nature of the study, as well as utilising a mixed method approach, a smaller sample size of 65 respondents was aimed for this study. According to Payne, Rigby, Stewart, Tate, and Vass (2018), a sample size of 30 respondents is deemed as sufficient for eye tracking experiments, however, no specified sample size is required for the eye tracking studies in general. Thus, the sample aimed to get at least 30 respondents for the plant-based milk drinkers and 30 respondents for the non-plant-based milk drinkers. In the end, N=70 participants were acquired to take into account any anomalies that occurred during the experiment. After completing the study, it was identified that the sample size of plant-based milk consumers was insufficient, with only acquiring 10 plant-based milk respondents. Therefore, an additional 20 plant-based milk consumers were required to meet the minimum criteria of 30 respondents per sample group. In total, 90 individuals participated in the study.

4.4.4 Sampling Frame

The sampling frame serves as a representation of the elements within the target population, thus facilitating the identification of potential participants (Malhotra, Nunan, & Birks, 2017). The sampling frame for this study consisted of individuals between the ages of 18 and 27 years living in Cape Town, South Africa. The participants were recruited through the UCT DSA mailing list and through social media platforms, allowing for a diverse range of participants. All the respondents were presented with the same stimuli; however, the stimuli were in a randomised order, with the exception of the word association task. Randomisation is an important tool for controlling the extraneous variables which are factors outside the main independent and dependent variables that can potentially impact the outcomes of an experiment (Malhotra, Nunan & Birks, 2017).

4.6 DATA COLLECTION METHOD

The data collection for this study included consumer neuroscience data collection, as well as self-report data and interviews.

4.6.1 Self-Report and Interview Data Collection Method

Traditional self-reporting techniques were utilised in the study, whereby the participants responses were recorded via key presses in the A/B task. There are numerous advantages and disadvantages of self-report data. Self-report data may be prone to bias as the participants may feel pressurised with the researcher present or are not sure of their answers. Neuroscience was utilised alongside self-report data to get unbiased and subconscious consumer responses. The word association task and the interview were other tasks utilised for data collection. The participants were to describe the product packaging out loud using one word. Furthermore, the interview took place after the eye tracking study, whereby the participants answered the questions posed by the researcher.

4.6.2 Consumer Neuroscience Data Collection Method

Consumer neuroscience is an increasingly used tool in market research methodologies (Oliveira, Guerreiro & Rita, 2022). Given that individuals are frequently unaware of their decision-making processes, it is crucial to examine their unconscious responses to stimuli (Oliveira, Guerreiro & Rita, 2022). Therefore, consumer neuroscience methods are often employed to measure these unconscious responses, and they are often favoured over the traditional self-reporting methods (Oliveira, Guerreiro & Rita, 2022). While there are numerous consumer neuroscience tools used in the research studies, this paper focussed on one tool, which is the eye tracking technology.

Eye tracking technology was the main tool used for consumer neuroscience data collection. Eye tracking is sensor technology, and it is an important tool utilised by marketers that can record and analyse eye movements and what individuals look at in real-time processing (Tobii, 2022). The technology is a non-invasive tool, and it is useful to investigate how long consumers fixate on a particular object or element (Oliveira, Guerreiro & Rita, 2022). It converts eye movements into data streams that contain various information such as pupil dilation, gaze vectors or gaze points (Tobii, 2022). Essentially, eye tracking technology decodes eye movements, and in return, translates them into insights (Tobii, 2022). This tool additionally allows for a robust understanding of the neurological processes of consumer behaviour (Casado-Aranda *et al.*, 2023). Eye tracking can help to improve marketing efforts such as understanding which aspects or elements influence consumers' visual attention. Moreover, eye tracking allows the researchers to gain insights into the humans' cognitive processes, without recording any brain activity.

Tobii eye tracking technologies are globally recognised as the leading tools in eye tracking. Tobii has created these versatile technologies designed for integration into

various environments and devices. They can be implemented into laptops, tablets, vehicles, VR or AR headsets or even bespoke medical equipment (Tobii, 2022). Tobii has developed a diverse range of devices to meet various needs, thereby emphasising mobility and the lean-data requirements as well as a seamless user experience while maintaining data privacy and integrity (Tobii, 2022). The common eye tracking devices include the Tobii eye tracking glasses, the Tobii Pro Spar, the Tobii Pro Spectrum, Tobii X2-30 as well as the Tobii Nano Pro. These technologies support a wide range of eyes, eye colour or retinal reflectivity (Tobii, 2022). The eye tracking data for this study was collected using the Tobii Pro Nano 60 Hz eye tracker, and data was recorded using the Tobii Pro Labs. Tobii Pro Labs is portable and non-invasive, and it offers robust capabilities varying between lighting adjustments, head movements and the tolerance for corrective lenses (Tobii, 2022). Tobii Pro Labs is preferred to the iMotions due to its capacity to process large volumes of eye tracking data, its diverse analysis and visualisation tools as well as its consistent timing and accuracy, thus resulting in more reliable data.

4.6.3 Data Collection Procedures

The participants were exposed to various stimuli on a laptop with a Tobii Pro Nano 60 Hz eye tracker mounted at the bottom of the screen. The Tobii Pro eye tracker was suitable for this study since it allows the researchers to take studies outside a lab environment (Tobii, 2022). As such, this study was conducted in a quiet room at the University of Cape Town. The Tobii Pro Nano is further designed to be utilised with smaller screens which provides a portable compact solution for the researchers, making it easier to use (Tobii, 2022).

The eye tracking experiment instructions for the tasks are in **Appendix F**, Figure 5.1 - 5.15. The eye tracker and the set up can be seen in **Appendix G**, Figure 6.1 - 6.3. The respondents were seated approximately 65-75cm away from the screen to collect real-time eye movements, which can be seen in **Appendix G**, Figure 6.4 (Tobii, 2022). A standard 9-point calibration task was administered at the start of the experiment to set up the eye tracking device, whereafter the respondents began the experiment. An example of this calibration can be found in **Appendix G**, Figure 6.5 - 6.7. The calibration was conducted on Tobii Pro Labs, and it presents the set of 9-point calibration targets. The 9-point calibration was the preferred number of targets chosen due to it generating more information for the system, thus optimising eye tracking capabilities. The participants were asked to focus on the white dots on the screen until they disappeared to calibrate the device. Once the calibration was completed, Tobii Pro Labs generated the results and the validation errors, which were either approved or denied. Calibration was repeated until the average accuracies were below 5%.

The crosshairs or fixation crosses were shown before each visual stimuli to ensure the respondent was fixating on the middle of the screen to avoid centre bias prior to being presented with the stimuli. In the first task, the milk product packages flashed on screen for 100ms. In the second task, the packages were shown for 2.5 seconds each, as research has shown that on average, consumers are seen to look at products on a shelf for that amount of time. A total of 10 product packages were shown. The order of stimuli presented were randomised for each participant.

Task 3 took form of the word association task, which is supported by the literature conducted by Piqueras-Fiszman, Velasco, Salgado-Montejo and Spence (2013). The respondents were instructed to freely use any adjective or word that came to mind to describe the product packaging. They were allowed to use the same word multiple times if necessary. The milk product packages were shown on screen for 10 seconds to ensure that the respondents had sufficient time to formulate their response. Task 4 involved an A/B task, whereby the participants used the left and right arrows on the laptop's keyboard to select the package they perceived as being more sustainable. The task included a total of 90 slides, each containing two different product packages for the participants to compare.

After completing the experiment, the respondents participated in a post-experiment interview. The respondent was given three papers, each with the three different groups of product packages: different colours, icons, and textual element. They were asked to sort these three groups into groups of perceived sustainability categories: most, medium and least sustainable in their mind. They were asked to justify their answers and respond to a series of other questions, which can be found in the **Appendix H**. Overall, eight questions were asked in this interview.

4.7 MEASUREMENT INSTRUMENTS

4.7.1 Questionnaire and Interview

A pre-screening questionnaire was given to all 90 participants before the eye tracking experiment to ensure they met the study requirements. The questionnaire, conducted via Google Forms, included questions about their age, their location, eye health as well the consumption of plant-based milk. The responses were visualised using pie charts and the diagrams created in excel to compare the responses. The interview was conducted using an iPad, thus allowing the respondents' responses to be recorded in real-time as they answered the questions.

4.7.2 Consumer Neuroscience Instrument

A Tobii Pro Nano 60Hz eye tracking device was selected for the study since the Tobii X2-30 screen based eye tracker, which was previously used, has been discontinued. The eye tracker was positioned at the bottom of the computer screen to gather data on eye movements (Farnsworth, 2017). This device was chosen for its ability to measure visual attention metrics such as fixation duration, the TFD, the TTFF as well as the average fixation duration. With a sampling rate of 60Hz, the Tobii Pro Nano produces high-quality data, and it is certified for various products (Farnsworth, 2017). It is typically applied in fixation-based studies and allows the researchers to record and analyse attentional processes in response to stimuli, thereby making it a suitable choice for this research (Farnsworth, 2017).

4.8 SCALING

Scaling involves the creation of a scale where measures are located along a continuum (Nunan, Birks & Malhotra, 2020). Reliability, in contrast, refers to the degree to which a scale yields consistent results when measurements of the same characteristic are repeated (Nunan, Birks & Malhotra, 2020). In this study, no Likert scales were utilised since the main quantitative analysis that was utilised was eye tracking technology. Moreover, reliability tests were not required.

4.9 DATA ANALYSIS

For this paper, the data that was analysed was the eye tracking metrics that were generated through Tobii Pro Labs and Microsoft excel. Tobii Pro Labs allows for the advanced analysis of eye tracking, and it is used to study visual attention and gaze behaviour. Tobii Pro Labs generates heat maps to visualise AOs, and measure metrics such as the TTFF, the average fixation duration and the TFD, which were analysed utilising inferential statistic techniques (Tobii, 2022). Thus, the AOs, the key press data as well as the eye tracking metrics were exported from the Tobii Pro Labs into an excel spreadsheet. The AOs drawn on the product packaging can be seen in **Appendix J**, Figure 7.1 - 7.10.

An APA reporting style was utilised in this paper since it promotes clarity, transparency and consistency. To test the data for any significance in the visual attention processes as well as salience, specific statistical tests were carried out. Tests of normality were carried out to select appropriate statistical tests. Thus, the Kolmogorov-Smirnov and the Shapiro-Wilk test were utilised to evaluate the normal distribution of the data. Moreover, the Chi-square test was carried out to determine if there was a significant association between the two categorical variables. The Chi-square test of independence is a statistical test commonly used to determine whether there is a significant association between two categorical variables. It helps to assess whether

the distributions of categorical variables differ from one another across different populations or settings. The test compares the observed frequencies in each category of a contingency table to the expected frequencies, which are calculated under the assumption that no association exists between the variables. After computing the Chi-Square statistic, a p-value was determined to indicate the probability of observing the data at least as extreme as the results obtained under the null hypothesis, which states that there was no association between the variables. Moreover, the Mann-Whitney U test was utilised to assess whether there were significant differences in the fixation durations between the plant-based milk consumers and the non-plant-based milk consumers.

Furthermore, Multinomial logistic regression, often referred to simply as "multinomial regression," is employed to predict a nominal dependent variable based on one or more independent variables. It can be viewed as an extension of binomial logistic regression, designed to handle a dependent variable with multiple categories rather than just two. Similar to other regression methods, multinomial logistic regression can include both nominal and continuous independent variables, and it can account for interactions between these variables to predict the outcome. The data for this study were analysed using Microsoft Excel and the Statistical Package for the Social Sciences (SPSS). SPSS facilitates the analysis of descriptive statistics and hypothesis testing, allowing for the application of inferential statistical techniques to test the study's hypotheses.

The paired-sample t-test is a statistical method used to compare the means of two related conditions or groups. Each participant provides data under both conditions, and the differences between these conditions for each individual are analysed. This test is particularly useful when evaluating the means of two conditions within the same group of participants, as it accounts for individual differences. The paired-sample t-test generates a t-value, degrees of freedom, and a p-value. The t-value reflects the magnitude of the difference between the two conditions' means in relation to the variability within the groups. Degrees of freedom are calculated as the number of pairs minus one. The p-value indicates the likelihood of observing the results if the null hypothesis (which states there is no difference between conditions) were true. A small p-value (usually less than 0.05) suggests that the observed difference is unlikely due to chance alone, leading to the rejection of the null hypothesis.

The paired t-test assumes that the differences between the pairs are normally distributed; utilising the histogram spreadsheet described on that page to check the normality. If the differences between pairs are severely non-normal, it would be better to use the Wilcoxon signed-rank test, which is a test procedure that compares the distributions of the paired variable sets. The procedure considers information about both the sign of the differences and the magnitude of the differences between pairs.

Assessing the normality of data is fundamental for selecting appropriate statistical tests. There were two tests that were utilised, the Kolmogorov-Smirnov and Shapiro-Wilk, to evaluate the normal distribution of the data. In statistics, the null hypothesis for normality tests states that the data in a sample comes from a population that follows a normal distribution. The normality tests are used to determine whether a dataset is significantly different from a normal distribution. The null hypothesis (H_0) states that the variable is normally distributed, and the alternative hypothesis (H_1) states that the variable is NOT normally distributed. So, after running this test:

- If $p \leq 0.05$: then the null hypothesis can be rejected (i.e., the variable is **NOT** normally distributed).
- If $p > 0.05$: then the null hypothesis cannot be rejected (i.e., the variable **MAY BE** normally distributed).

Whilst the quantitative studies focus on numerical values, qualitative data analysis involves the analysis of words (Malhotra, 2010). The sole purpose of qualitative data analysis is to explore meaningful patterns and themes that arise from the experiment (Malhotra, 2010). The qualitative data was therefore analysed using a “thematic analysis technique” (Braun & Clarke, 2006). Here, the researcher familiarises themselves with the data by transcribing particular takeaways from the interviews or responses (Braun & Clarke, 2006). Initial codes are then generated, and themes are consequently explored in accordance with each respondent’s answer. Thereafter, a visual interpretation of the data is developed to assist in revealing patterns as well as the relationships present within the data (Malhotra, 2010). During thematic analysis, the researchers analyse and report the themes found among the respondent’s answers and the data (Braun & Clarke, 2006), which was carried out in this particular study. As such, the themes of the word association task were carried out, understanding which words were most commonly used for the specific package. Moreover, in the interview, various themes were drawn to gain insights into the participants’ responses.

4.11 ETHICAL CONSIDERATIONS

Ethical concerns are paramount in any research involving a targeted set of respondents (Nunan, Birks & Malhotra, 2020). Since the field of consumer neuroscience and neuromarketing is seen as an emerging field in research, it is extremely important to take ethical considerations into account (Thomas *et al.*, 2017). The research conducted for this study adhered to the University of Cape Town’s Higher Degrees Committee and the Ethics in Research Committee to ensure that the well-being and the rights of the participants were protected throughout the study. The approval of this study was obtained by the University of Cape Town’s Higher Degrees Committee as well as the Ethics in Research Committee, as shown in **Appendix A**, Figure 1.1.

Furthermore, participation in this study was voluntary, and the respondents had the right to withdraw at any time. To ensure confidentiality, all the responses and the data collected were kept anonymous and stored on a password protected device (UCT Ethics Handbook, 2019). The invitations to participate in the study were sent to the UCT students through the UCT Database, following the approval from the UCT DSA Approval committee, as detailed in **Appendix A**, Figure 1.2. This invitation outlined the study's objectives and the participation requirements (UCT Ethics Handbook, 2019) as shown in **Appendix A**, Figure 1.3.

Additionally, all the participants were provided with an informed consent form at the beginning of the experiment. This form provided in-depth information regarding the study, the nature of the research, and any relevant ethical considerations (UCT Ethics Handbook, 2019). The participants were required to provide their name, age, signature and participant ID on the form. To ensure confidentiality, the respondents remained anonymous at all times and the responses that were recorded through eye tracking were kept confidential and stored securely on a password-protected laptop utilised solely for the purpose of the study. Since the research was relatively non-invasive and only recorded eye movements from a specific distance, the storage and management of data complied with the current POPIA act.

Lastly, the consent to use *OKJA's* milk product packaging was obtained from *OKJA's* CEO, allowing this study to use their *Original Oat Milk* as the main product for this paper, which can be found in **Appendix A**, Figure 1.4. Thus, *OKJA's* oat milk product packaging was modified in terms of colours, added icons as well as different textual elements.

4.12 CONCLUSION

This chapter meticulously outlined the research methodology employed for the study, offering pertinent justifications for the tools, methods, procedures, and the utilised instruments. Initially, the research philosophy was analysed, leading to a pragmatic paradigm to be most relevant for a mixed-method approach. Subsequently, the research strategy and design were explored, incorporating an exploratory research design alongside a mixed-method approach which integrates both quantitative and qualitative data analyses. The quantitative aspect involved employing eye tracking technology to derive attentional statistics, while the qualitative approach comprised of a word association task and an interview conducted at the end of the experiment.

Following this, the target population of this study was identified, and it consisted of individuals aged between 18 and 27 years old residing in Cape Town, South Africa; with a split between plant-based and non-plant-based milk consumers. Initially, the sample size aimed to get 65 respondents in total. However, upon completing the study, it became apparent that more plant-based milk consumers were required.

Consequently, an additional 20 participants were required to meet the minimum requirement of 30 participants per study group.

Following on from this, the data collection methods were thoroughly examined, encompassing the process of eye tracking data collection as well as the interview data collection. Additionally, the procedures of the study were meticulously outlined, providing detailed descriptions of each task to ensure clarity and conciseness. The visual representations of the study design are provided in the Appendix. Furthermore, the measurement instruments were discussed and the process behind the data analysis was detailed. Lastly, the ethical considerations were additionally addressed to ensure the study's adherence to the ethical standards according to the UCT ethical guide. The subsequent chapter presents the research findings and results.

CHAPTER 5: PRESENTATION OF RESULTS AND DISCUSSIONS

5.1 INTRODUCTION

In this extensive data analysis, the study aimed to explore the influence of the implicit cues (such as colour and iconography) and the explicit cues (textual information) on product packaging, specifically targeting the communication of sustainability in plant-based (oat milk) products. The cues which impact the visual attention and perceived sustainability among the young adults in Cape Town, South Africa were subsequently investigated.

This analysis provides a comprehensive examination of the collected data, encompassing detailed results and interpretation. Additionally, it incorporates the demographic characteristics of the respondents and the relevant descriptive and inferential statistics to enrich the understanding of the findings. The results from the eye tracking experiment were generated through Tobii Pro Labs and were subsequently exported to excel. Similarly, the qualitative experiment results were exported to excel where the coding and analysis was facilitated by Atlas.ti.

5.2 DESCRIPTIVE STATISTICS

This section describes the descriptive statistics for the sample population.

5.2.1 Sample Composition

Prior to conducting the experiment, the participants completed a screening questionnaire to determine whether they were eligible for the study. The respondents were required to be within the ages of 18 to 27 years, reside in Cape Town and have normal vision to participate. Furthermore, the respondents were split up in terms of whether they consumed plant-based milk or not. All the participants consented to the study criteria which described the nature of the study, and signed their name, age, and participant identification (ID) which can be shown in **Appendix K**, Figure 8.1 and 8.2. The table depicting these statistics is shown below.

Table 1: Age Range of Participants

Age		
	N	%
18 - 21 years	37	41,1
22 - 24 years	23	25,6
25 - 27 years	30	33,3
Total	90	100

The screening questionnaire provided valuable insights into the demographic characteristics and the habits of the respondents. This distribution indicates a relatively balanced representation across the specified age groups. Furthermore, all the respondents resided in Cape Town, thereby indicating that the study's target population exclusively comprised of individuals from this geographic location. Additionally, the absence of eye-related issues among all the participants ensured a consistent baseline for visual perception and attention during the study.

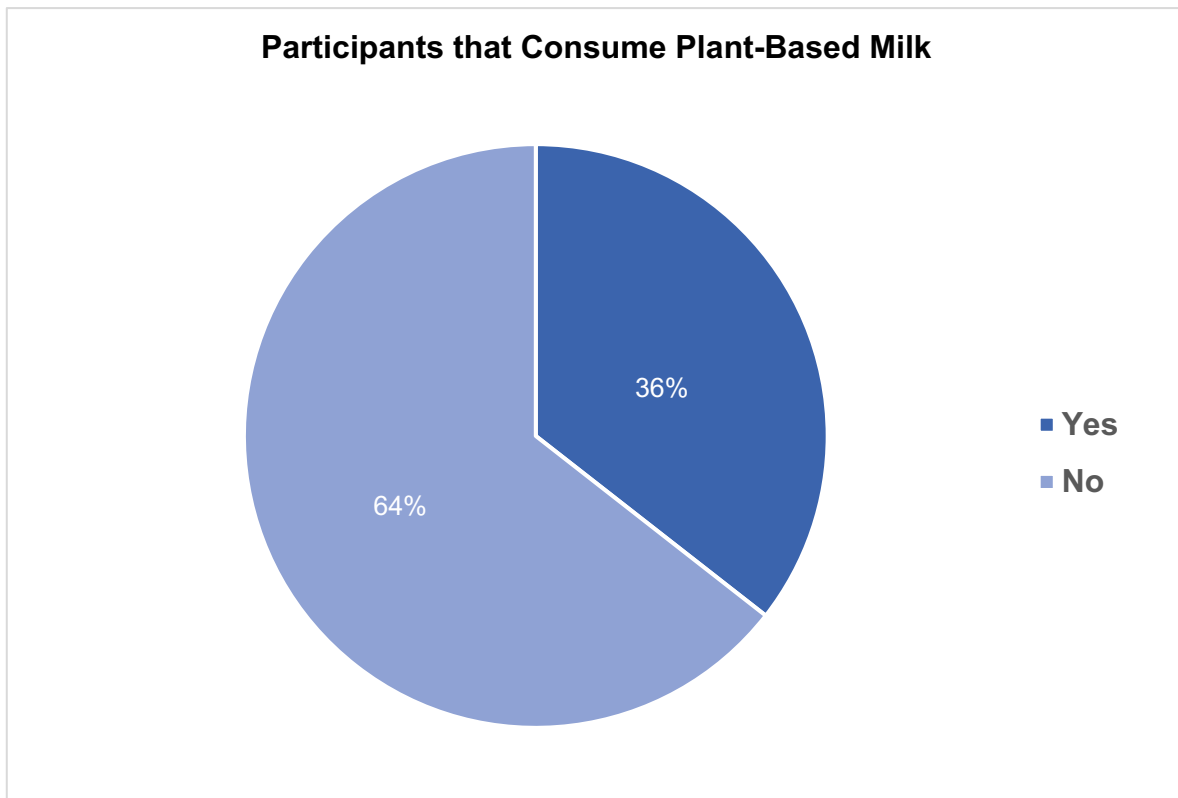
5.2.2 Age Groups and Plant-Based Milk Consumption

The relationship between the age groups and regular plant-based milk consumption was examined using a cross-tabulation. The age groups that were considered were 18-21 years, 22-24 years, and 25-27 years, as shown in Table 2 below.

Table 2: Plant-Based Milk Consumption Amongst Participants

			Do you consume plant-based milk regularly? i. e. do you consume it more than twice a week?		Total
			No	Yes	
Age	18 - 21 years	N	27	10	37
		%	73%	27%	100%
	22 - 24 years	N	14	9	23
		%	60,9%	39,1%	100%
	25 - 27 years	N	17	13	30
		%	56,7%	43,3%	100%
Total		N	58	32	90
		%	64,4%	35,6%	100%

Figure 4: Graph Depicting Consumers that Consume Plant-Based Milk



The descriptive statistics presented in Table 9 in **Appendix K** illustrates the Time to First Fixation (TTFF) and Total Fixation Durations (TFD) across the various treatment groups. The TTFF for Blue Pack, Green Pack, Beige Pack, and Brown Pack consisted of 90 observations each.

The mean TTFF for the Blue Pack group was 0.02 ($M = 0.02$, $SD = 0.073$), while for the Green Pack group it was 0.01 ($M = 0.01$, $SD = 0.053$). Similarly, the mean TTFF for the Beige Pack group was 0.02 ($M = 0.02$, $SD = 0.099$), and for the Brown Pack group, it was 0.01 ($M = 0.01$, $SD = 0.042$). These findings suggest potential differences in the fixation times across the various background colours. Notably, the Green and Brown Pack groups exhibited slightly lower mean TTFF compared to the Blue and Beige Pack groups. Additionally, the variability in the TTFF scores within each group, as indicated by the standard deviations, ranged from 0.042 to 0.099.

The mean total fixation duration for the Blue Pack group was 2.08 ($M = 2.08$, $SD = 0.40$), for the Green Pack group it was 2.13 ($M = 2.13$, $SD = 0.35$), for the Beige Pack group it was 2.15 ($M = 2.15$, $SD = 0.35$), and for the Brown Pack group it was 2.17 ($M = 2.17$, $SD = 0.30$). These findings suggest that there were slight variations in the total fixation durations across the different background colours. Notably, the Brown Pack group exhibited the highest mean total fixation duration, followed closely by the Beige Pack group, while the Blue Pack group had the lowest mean duration.

Table 3 further provides insights into the TTF across six treatment groups: Recycle Icon, Vegan Icon, FSC Icon, Vegan Text, Plant-based Text, and Dairy-free Text. Each group consisted of 90 observations. The mean TTF for the Recycle Icon group was 0.25 (M = 0.25, SD = 0.574), for the Vegan Icon group it was also 0.25 (M = 0.25, SD = 0.525), and for the FSC Icon group, it was 0.51 (M = 0.51, SD = 0.708). Furthermore, the mean TTF for the Vegan Text group was 0.06 (M = 0.06, SD = 0.274), for the Plant-based Text group it was 0.35 (M = 0.35, SD = 0.720), and for the Dairy-free Text group it was 0.33 (M = 0.33, SD = 0.638). These findings suggest potential differences in the TTF across the various elements on packaging.

The table offers insights into the Total Fixation Durations (TFD) across six treatment groups, each group comprised of 90 observations. Notably, the mean TFD for the textual elements differed from that of the icon groups. Specifically, the mean TFD for the Vegan Text group was the lowest at 0.01 (M = 0.01, SD = 0.049), followed by the Plant-based Text group at 0.09 (M = 0.09, SD = 0.204), and the Dairy-free Text group at 0.12 (M = 0.12, SD = 0.248). Conversely, the mean TFD for the icon groups (Recycle Icon, Vegan Icon, and FSC Icon) ranged from 0.08 to 0.25. These findings suggest that the textual elements on packaging elicited shorter total fixation durations compared to the iconographic elements.

Lastly, Table 3 shows that the mean total fixation duration for the Recycle Icon group was 0.08 (M = 0.08, SD = 0.21), for the Vegan Icon group it was 0.11 (M = 0.11, SD = 0.24), and for the FSC Icon group it was 0.25 (M = 0.25, SD = 0.37). These findings suggest potential differences in the total fixation durations across the different sustainability icons. Notably, the FSC Icon group exhibited the highest mean total fixation duration, followed by the Vegan Icon group, while the Recycle Icon group had the lowest mean duration.

5.3 QUANTITATIVE DATA ANALYSIS: HYPOTHESIS TESTING

Table 3: Tests of Normality

	Kolmogorov-Smirnov	Shapiro-Wilk
	Statistic	Statistic
Non-Visually Salient (TTFF)	0,391	0,359
Visually Salient (TTFF)	0,516	0,257
Visually Salient (TFD)	0,221	0,674
Non-Visually Salient (TFD)	0,265	0,637
Other Icons (Vegan and FSC Icons)	0,232	0,789
Recycle Icon	0,465	0,465
Sustainability Icons	0,258	0,832
Other AOIs	0,276	0,724
Textual elements	0,268	0,711
Packaging elements	0,232	0,789

Table 4: Hypothesis Test Summary

	Null Hypothesis	Test	P Value	Decision	Standardized Test Statistics
1a	The median of differences between Visually Salient and Non-Visually Salient equals 0.	Related-Samples Wilcoxon Signed Rank Test	0,162	Retain the null hypothesis	1,400
1b	The median of differences between Visually Salient and Non-Visually Salient equals 0.	Related-Samples Wilcoxon Signed Rank Test	0,633	Retain the null hypothesis	0,477
1c	The median of differences between Recycle Icon and Other Icons (Vegan and FSC Icons)	Related-Samples Wilcoxon Signed Rank Test	0,000	Reject the null hypothesis	3,683
1d	The median of differences between Sustainability icons (Recycle Icon, Vegan Icon, FSC Icon) and other AOIs (Vegan Text, Plant-based Text, Dairy-free Text) equals 0.	Related-Samples Wilcoxon Signed Rank Test	0,085	Retain the null hypothesis	-1,722
1e	The median of differences between Textual elements (Vegan Text, Plant-based Text, Dairy-free Text) and (Recycle Icon, Vegan Icon, FSC Icon) equals 0.	Related-Samples Wilcoxon Signed Rank Test	0,003	Reject the null hypothesis	2,921
Asymptotic significances are displayed. The significance level is .05.					

Given the results from tables above, the following hypotheses were tested:

Hypothesis H1a: The background colours that result in more visually salient products (green) will produce lower Time to First Fixation (TTFF) than the colours that are not visually salient (blue, beige, brown).

According to the normality test results in Table 4 above, the Non-Visually Salient and Visually Salient did not meet the criteria for normality. The results of hypothesis testing using a non-parametric test, specifically the Wilcoxon signed-rank test were used. This test was chosen due to the non-normal distribution of the data.

A Wilcoxon signed-rank test was performed to assess whether there was a significant difference in the TTFF between the background colours resulting in not visually salient products (Blue, Beige, and Brown) and those visually salient (Green). The median difference between the TTFF for the salient and the non-salient conditions was not statistically different from zero ($Z = 1.400$, $p = .162$), indicating that there is insufficient evidence to reject the null hypothesis.

Thus, based on these results, the null hypothesis is retained. This suggests that there was no significant difference in the TTFF between the visually salient and the non-visually salient conditions. Therefore, the data does not support the hypothesis that the background colours resulting in more visually salient products lead to a lower TTFF. These results suggest that in this study, the background colour saliency did not significantly influence the speed of initial fixation on products, contrary to the initial hypothesis.

Hypothesis H1b: The background colours which result in more visually salient products (green) will produce higher total fixation durations than the colours that are not visually salient (blue, beige, brown).

Based on the findings presented in Table 4, it is evident that both the Non-Visually Salient and the Visually Salient conditions did not adhere to the assumption of normality. Given this deviation from normality, the appropriate statistical approach for hypothesis testing involved a non-parametric test. Specifically, the Wilcoxon signed-rank test was utilised.

The results of the Wilcoxon signed-rank test shown in Table 5 do not support Hypothesis H1b, which proposed that the background colours resulting in more visually salient products (green) would yield higher total fixation durations compared to the colours that are not visually salient (blue, beige, brown). The test revealed a non-significant difference in the total fixation durations between the visually salient and the non-visually salient conditions ($Z = 0.477$, $p = .633$), thus failing to reject the null hypothesis. These findings suggest that based on the data analysed, there is insufficient evidence to conclude that the background colours resulting in more visually salient products lead to higher total fixation durations. Consequently, it appears that background colour saliency, as operationalised in this study, may not exert a significant influence on the duration of fixations during the visual processing tasks.

Hypothesis H1c: The sustainability icon including the recycle logo will produce significantly higher total fixation durations than the other icons (Vegan and FSC icons).

Normality tests using the Kolmogorov-Smirnov and the Shapiro-Wilk tests were conducted for two icon categories: "Other Icons (Vegan and FSC Icons)" and "Recycle Icon". The results indicate significant deviations from normality for both categories ($p < 0.05$). Hence, the non-parametric tests are recommended for further analysis to ensure robustness and the accurate interpretation of results.

According to the Wilcoxon signed-rank test, there is a statistically significant difference in the total fixation durations between the Recycle Icon packs and the Other Icons (Vegan and FSC Icons) packs ($Z = 3.683$, $p = .000$). Therefore, the null hypothesis is rejected. This finding suggests that the Recycle Icon packs elicit different total fixation durations compared to the Vegan and FSC icon packs. The rejection of the null hypothesis implies that there are significant differences in the total fixation durations between the Recycle Icon packs as well as the Vegan and FSC icon packs. This indicates that the type of icon pack being viewed influences the duration of fixations during the visual processing tasks.

Hypothesis H1d: The time to first fixation will be lower for the sustainability icons than for the other AOs on the packaging such as the textual elements

The normality tests using the Kolmogorov-Smirnov and the Shapiro-Wilk tests were conducted for the sustainability icons and for the other AOs. The results shown in Table 4 above, indicate significant deviations from normality for both the Sustainability Icons (KS: $p < 0.05$, SW: $p < 0.05$) and Other AOs (KS: $p < 0.05$, SW: $p < 0.05$). These findings suggest that the assumption of normality is violated for both datasets, thus indicating the need for alternative non-parametric tests for analysis.

The Wilcoxon signed-rank test results shown above in Table 5 show that there is no statistically significant difference in the TFF between the Sustainability icons (Recycle Icon, Vegan Icon, FSC Icon) and other AOs (Vegan Text, Plant-based Text, Dairy-free Text) on packaging ($Z = -1.722$, $p = .085$). Therefore, the null hypothesis is retained. This finding suggests that the TFF is not significantly lower for the Sustainability icons compared to the other AOs on packaging such as the textual elements. The retention of the null hypothesis implies that there is no significant difference in the TFF between the sustainability icons and the other AOs on packaging. This indicates that contrary to the hypothesis, the sustainability icons may not attract quicker initial fixations compared to the textual elements related to sustainability.

Hypothesis H1e: The textual elements will generate higher total fixation durations than the other packaging elements such as icons

The Kolmogorov-Smirnov and Shapiro-Wilk tests were employed to assess the normality of the data distributions for the textual elements and the packaging elements.

Both tests revealed significant deviations from normality for the Textual elements (KS: $p < 0.05$, SW: $p < 0.05$) and for the Packaging elements (KS: $p < 0.05$, SW: $p < 0.05$). Hence, the data distributions for both types of elements do not meet the assumption of normality. This necessitates the use of alternative non-parametric methods for further analysis.

According to the results in Table 5, there is a statistically significant difference in the total fixation durations between the textual elements (Vegan Text, Plant-based Text, Dairy-free Text) and the other packaging elements (Recycle Icon, Vegan Icon, FSC Icon) ($Z = 2.921$, $p = .003$). Therefore, the null hypothesis is rejected. This finding suggests that the textual elements generate higher total fixation durations than the icons on packaging. The rejection of the null hypothesis indicates that there is a significant difference in the total fixation durations between the textual elements and the icons on packaging. This suggests that the textual elements, including Vegan Text, Plant-based Text, and Dairy-free Text, attract longer durations of visual attention compared to the icons such as the Recycle Icon, Vegan Icon, and FSC Icon.

Hypothesis H2a: Product packaging including the sustainability icons will be perceived as more sustainable than the product packaging without icons.

In an analysis of the association between product packaging and perceived sustainability as shown in Table 10, in **Appendix L**, a Chi-square test of independence revealed a statistically significant relationship ($p < 0.05$). This indicates that the presence of sustainability icons is perfectly associated with how sustainability is perceived across the different categories. Hypothesis H2a posited that, "Product packaging including sustainability icons will be perceived as more sustainable than product packaging without icons". The results strongly support this hypothesis since the results can be interpreted as showing that the sustainability icons are not only noticed but also profoundly influence consumer perception, thus aligning perfectly with the intent to be perceived as more sustainable.

Hypothesis H2b: Product packaging including sustainability text will be perceived as being more sustainable than the product packaging without the text.

A Chi-square test of independence was conducted to evaluate the impact of the sustainability-related text on the perception of sustainability across the packaged products, as shown in Table 11, **Appendix L**. The test revealed a significant association between the presence of the sustainability text and the categories of perceived sustainability ($p < .001$). This finding substantiates the claim that the textual information on the packaging considerably affects how sustainability is perceived by the consumers. This differentiation highlights that sustainability-related text does not

merely serve as an additional feature, but it plays a pivotal role in enhancing the perceived sustainability of a product.

Hypothesis H3a: There is a positive relationship between the level of attention generated by the sustainability cues (TTFF and TFD) and the consumers perception of sustainability.

For the hypothesis, "There is a positive relationship between the level of attention generated by sustainability cues (TTFF and TFD) and consumers' perception of sustainability," where the perception of sustainability is measured across categorical outcomes, Multinomial Logistic Regression was used. For Hypothesis H3a, given the setup and goals, Multinomial Logistic Regression is the recommended statistical test because it can analyse the effect of continuous predictors on a multinomial dependent variable effectively. It will provide a deeper understanding of how the attention metrics influence different perceptions of sustainability.

Table 5: Parameter Estimates

Parameter Estimates									
Perceived Sustainability		B	Std. Error	Wald	df	Sig.	Exp(B)	95% Confidence Interval for Exp(B)	
								Lower Bound	Upper Bound
Vegan Text	Intercept	-0,194	0,570	0,116	1	0,733			
	TTFF	-0,002	0,019	0,007	1	0,934	0,998	0,962	1,037
	TFD	0,043	0,048	0,792	1	0,373	1,043	0,950	1,146
FSC Icon	Intercept	0,095	0,546	0,030	1	0,862			
	TTFF	0,002	0,020	0,013	1	0,909	1,002	0,964	1,042
	TFD	-0,001	0,052	0,000	1	0,983	0,999	0,902	1,106
Dairy-free Text	Intercept	-0,159	0,571	0,078	1	0,780			
	TTFF	-0,013	0,020	0,431	1	0,511	0,987	0,948	1,027
	TFD	0,066	0,048	1,907	1	0,167	1,068	0,973	1,173
Vegan Icon	Intercept	-0,108	0,563	0,037	1	0,848			
	TTFF	0,008	0,019	0,167	1	0,683	1,008	0,971	1,046
	TFD	0,004	0,051	0,005	1	0,941	1,004	0,909	1,108
Recycle Icon	Intercept	-0,227	0,575	0,156	1	0,693			
	TTFF	0,002	0,019	0,010	1	0,920	1,002	0,965	1,040
	TFD	0,031	0,049	0,408	1	0,523	1,032	0,938	1,135
a. The reference category is Plant-based Text.									

The multinomial logistic regression analysis explored the effect of the TTFF and the TFD on different perceived sustainability categories, with 'Plant-based Text' serving

as the reference category. The findings indicated that the model including these predictors did not significantly improve the fit over a baseline model that included no predictors, as evidenced by a Chi-square of 4,792 (df = 10, p = .905). This suggests that the TTFF and the TFD, as measures of attention do not substantially influence how sustainability is perceived across the examined categories. The odds ratios Exp(B) for both TTFF and TFD were close to 1 for all categories, such as the Vegan Text, FSC Icon, Dairy-free Text, Vegan Icon, and the Recycle Icon, thus indicating no significant enhancement in the likelihood of any sustainability category being favoured over the reference category due to these attention metrics.

These results imply several key points relative to Hypothesis 3a, which posited a positive relationship between the level of attention to sustainability cues and the perception of sustainability. Firstly, the lack of significant effects challenges the hypothesis, thus suggesting that simply increasing the time someone first notices or focuses longer on sustainability-related cues may not necessarily enhance their perception of a product or item as being more sustainable.

Hypothesis H3b: The presence of colour will have a positive impact on the consumers' perception of sustainability.

The Chi-square tests as shown in Table 16, **Appendix L**, were conducted to examine the impact of the presence of specific colours (Green, Beige, Brown, and Blue) on the perception of sustainability revealed statistically significant results ($p < .05$ for all colours), strongly supporting Hypothesis H3b. Each colour, when present, was universally perceived as being indicative of sustainability. Each colour, when present on a slide, was consistently associated with high rates of perceived sustainability. Notably, the slides featuring the colours Green, Beige, Brown, or Blue were predominantly perceived as sustainable, underscoring these colours' strong influence on sustainability perceptions. The absence of these colours in the dataset led to a more varied perception of sustainability, as evident from the crosstab percentages showing diverse sustainability attributes associated with non-colour elements like Dairy-free Text and FSC Icon. These variations suggest that while the presence of specific colours significantly enhances the perception of sustainability, the other elements also contribute to sustainability perceptions but without the same level of definitive impact.

Hypothesis H3c: The inclusion of sustainability icons will positively influence the consumers' perception of sustainability.

The Chi-square tests shown in Table 17 in **Appendix L**, were conducted to examine the impact of specific sustainability icons - Recycle Icon, Vegan Icon, and FSC Icon - on perceptions of sustainability, consistent with Hypothesis H3c. The results revealed a significant association between the presence of each icon and the perception of

sustainability, with p-values less than .05 for all icons. These findings indicate a robust correlation between the presence of these icons and enhanced perceptions of sustainability. Specifically, the presence of the Recycle Icon on slides was associated with a uniformly positive sustainability perception, thereby suggesting that this icon effectively communicates sustainability values. Similarly, the slides featuring the Vegan Icon were consistently perceived as sustainable, thus highlighting its effectiveness in signalling environmental friendliness. Likewise, the presence of the FSC Icon was also strongly associated with sustainability perceptions, emphasising its credibility in conveying sustainable practices. These results strongly support Hypothesis H3c and suggest that the strategic use of these icons in visual media or product packaging can significantly shape the consumer perceptions, consistently enhancing the recognition of sustainability features across various contexts.

Hypothesis H3d: Textual elements will positively influence the consumers' perception of sustainability.

The Chi-square test results presented in Table 18 in **Appendix L** indicate a statistically significant relationship between the presence of specific textual elements (Vegan Text, Plant-based Text, Dairy-free Text) and increased perceptions of sustainability, with all p-values reported as 0.000. These findings provide strong support for Hypothesis H3d, which posited that the textual elements positively influence the consumers' perceptions of sustainability. Specifically, the instances featuring Vegan Text, Plant-based Text, or Dairy-free Text were exclusively associated with perceived sustainability, thus illustrating the potent impact of these textual cues on the sustainability perceptions. This significant association underscores the effectiveness of these textual elements in communicating environmental benefits, which can be crucial for the product marketing strategies aimed at environmentally conscious consumers.

Hypothesis H4a: The average fixation durations of individuals who consume plant-based milk will be significantly higher when observing plant-based milk product packaging in comparison to those who do not drink plant-based milk.

In this study, using the independent samples T-test was initially considered, also known as the two-sample t-test or the student's t-test. This statistical procedure is designed to determine whether there are significant differences between the means of two independent groups on a particular continuous dependent variable. Typically applied to compare the means across two groups, this test assesses if the observed differences are likely due to random chance or to specific interventions or characteristics. For the analysis, an independent samples T-test would have been performed for each colour and feature between the two groups: plant-based vs. non-plant-based milk consumers. This approach aims to identify the significant differences

in the average fixation durations on different package colours/features between the groups.

However, the preliminary tests of normality (Kolmogorov-Smirnov, Shapiro-Wilk) indicated that the data was not normally distributed, a scenario common in studies with smaller sample sizes or skewed data distributions. Consequently, the non-parametric tests were opted for, which do not assume a normal distribution of the data.

Given the nature of the research hypotheses (H4a and H4b) and the distribution characteristics of the dataset, the most appropriate non-parametric test applied was the Mann-Whitney U test, also known as the Wilcoxon rank-sum test. This test is particularly suited for comparing differences between two independent groups when the dependent variable is either ordinal or continuous but not normally distributed. By ranking all the data points collectively, the Mann-Whitney U test analyses the ranks to determine the significant differences between the groups, thus providing a robust analysis method for the study's requirements.

Table 6: The Shapiro-Wilk and Kolmogorov-Smirnov Tests

	Kolmogorov-Smirnov	Shapiro-Wilk
	Statistic	Statistic
Blue	0,287	0,446
Green	0,268	0,454
Beige	0,238	0,449
Brown	0,275	0,494

The Shapiro-Wilk and the Kolmogorov-Smirnov tests (see Table 7) were conducted to assess the normality of the fixation durations for four different colour variables: Blue, Green, Beige, and Brown. The results indicated significant deviations from normality for all variables. The results suggest that the fixation duration data for all colour variables do not follow a normal distribution. Consequently, the nonparametric tests are recommended for subsequent analyses involving these variables.

The Mann-Whitney U test in Table 19, **Appendix L**, was utilised to assess whether there were significant differences in the fixation durations between the plant-based milk consumers and the non-plant-based milk consumers for four packaging colour categories: Blue, Green, Beige, and Brown. The results showed that there were no significant differences in the fixation durations for the Blue ($U=921.000$, $z=-0.258$, $p=.796$), Beige ($U=841.000$, $z=-0.926$, $p=.355$), and Brown ($U=843.500$, $z=-0.904$, $p=.366$) categories. However, a significant difference was found for the Green category ($U=713.500$, $z=-1.987$, $p=.047$), thus indicating that the plant-based milk

consumers had significantly lower fixation durations compared to the non-plant-based milk consumers for green packaging. These results suggest that the colour of the packaging may influence the attentional engagement of consumers depending on their dietary preferences, particularly noted in the Green packaging category.

Hypothesis H4b: The average fixation durations of the individuals who consume plant-based milk will be significantly higher when observing the sustainability visual cues such as the icons and text in comparison to those who do not drink plant-based milk.

Table 7: Tests of Normality

	Kolmogorov-Smirnov	Shapiro-Wilk
	Statistic	Statistic
Recycle Icon	0,461	0,454
Vegan Icon	0,445	0,506
FSC Icon	0,322	0,729
Vegan Descriptor	0,538	0,209
Plant Based Descriptor	0,429	0,609
Dairy Free Descriptor	0,403	0,534

The normality tests, specifically the Shapiro-Wilk tests shown in Table 8 above, were conducted on the fixation duration data associated with various sustainability-related visual cues, including both icons (Recycle, Vegan, FSC) and text descriptors (Vegan, Plant-Based, Dairy-Free). The results indicated significant deviations from normality across all the visual cue categories ($p < .05$). These findings confirm that the distribution of data for both icons and text descriptors does not adhere to normality. Therefore, it is recommended to employ the non-parametric tests to further analyse the differences in fixation durations between the plant-based and the non-plant-based milk consumers.

In an analysis of fixation durations on sustainability-related visual cues, the Mann-Whitney U test shown in Table 20, **Appendix L**, was employed to evaluate the differences between the plant-based and the non-plant-based milk consumers. Contrary to the expectations stated in hypothesis H4b, the statistical outcomes did not reveal significant disparities across any categories of visual cues: Recycle Icon ($U=876$, $z=-0.926$, $p=.354$), Vegan Icon ($U=915.5$, $z=-0.417$, $p=.676$), FSC Icon ($U=899$, $z=-0.488$, $p=.626$), Vegan Descriptor ($U=927.5$, $z=-0.571$, $p=.568$), Plant-Based Descriptor ($U=948$, $z=-0.042$, $p=.966$), and Dairy-Free Descriptor ($U=872$, $z=-0.843$, $p=.399$).

These results imply that the presence of plant-based dietary habits does not influence the attention paid to the sustainability cues on product packaging, as measured by the fixation durations. The lack of significant findings suggests that both the consumer groups, regardless of their dietary preferences, may have similar levels of engagement with the sustainability labels. This outcome could indicate that other factors, such as individual interest in sustainability or the visual appeal of the labels themselves, might play a more central role in capturing consumer attention than the dietary preferences alone.

The analysis of Table 20, which tested the hypothesis regarding the differences in the perception of product sustainability between the plant-based milk drinkers and the non-plant-based milk drinkers, yielded a p-value of 0.681. This result signifies no statistically significant difference in how sustainability is perceived across various categories such as Blue, Brown, Beige, Green, Dairy-free Text, FSC Icon, Plant-based Text, Recycle Icon, Vegan Icon, and Vegan Text between the two groups. The Chi-square test revealed no significant association between the type of milk consumed and the sustainability perceptions ($p > .681$). Both groups exhibited similar percentages across the sustainability categories; for instance, the plant-based milk drinkers reported 9.1% for 'Green' and 15.2% for 'FSC Icon,' compared to 8.9% and 14% respectively for the non-plant-based milk drinkers.

Despite minor variations in the distribution of responses, such as the non-plant-based milk drinkers showing slightly higher percentages for 'Plant-based Text' and 'Recycle Icon,' these differences did not reach statistical significance. This suggests that the consumer perceptions of sustainability are similarly shaped regardless of their preference for plant-based or non-plant-based milk, thus indicating that other factors may be more influential in shaping the sustainability perceptions than the dietary choices alone.

5.4 QUALITATIVE STATISTICS

The qualitative component of this study presents the findings from a thematic analysis conducted on the survey data concerning the consumer perceptions of sustainability in milk product packaging. The participants were asked to categorise various milk product packages into three groups based on their perceived sustainability: least sustainable, medium sustainable, and most sustainable. This qualitative approach aimed to uncover the underlying themes and factors influencing consumer judgments regarding the sustainability of packaging materials. The thematic analysis involved a detailed examination of the responses to identify common patterns and themes. This method provided insight into the criteria and the considerations that the participants use to assess the sustainability of milk product packaging. By categorising the data into meaningful themes, the aim was to enhance the understanding of consumer perceptions and inform the strategies for developing more sustainable packaging

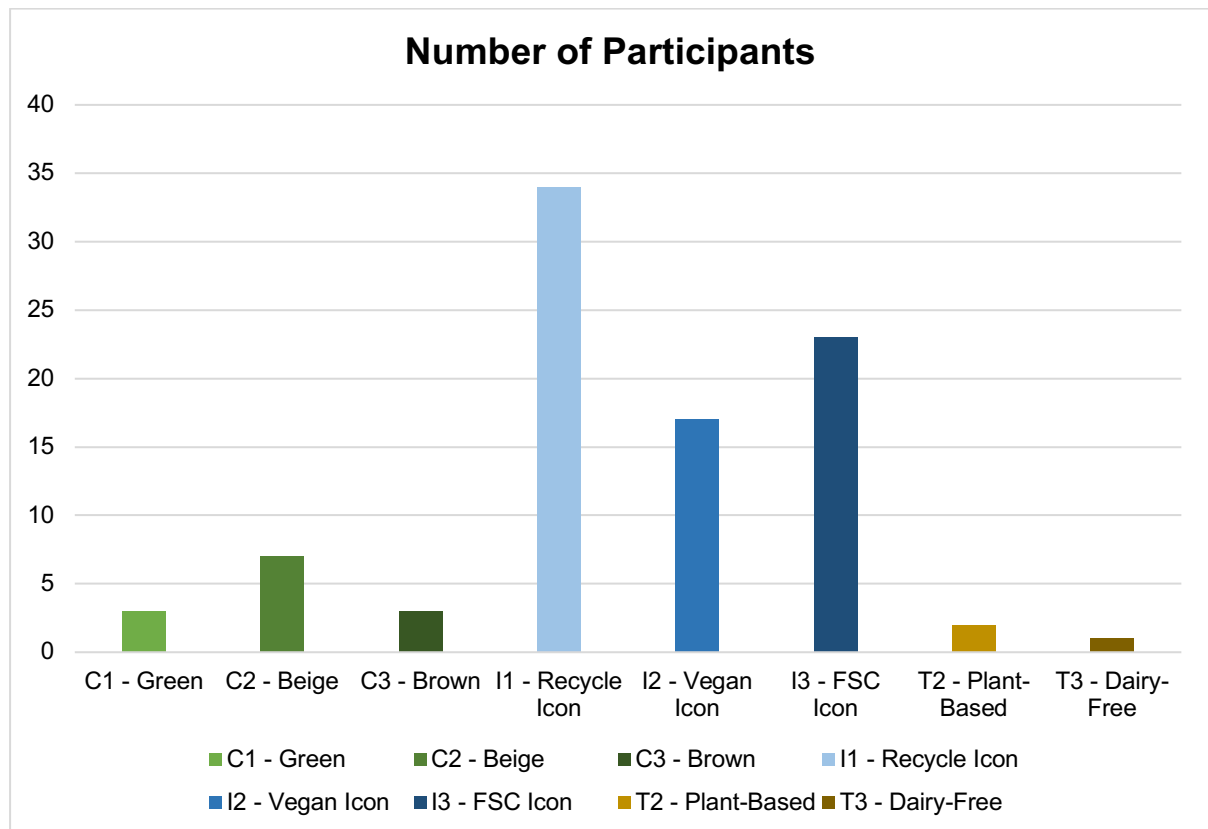
solutions. Through this analysis, several key themes emerged, thus reflecting the diverse factors that consumers consider when evaluating the sustainability of milk product packages. These themes offer valuable insights into the consumer priorities and perceptions, which can guide packaging design and marketing strategies in the dairy industry.

5.5 DATA ANALYSIS

A thematic analysis methodology was employed to analyse the data provided by the 90 participants. This approach is recognised for its rigour and inductive nature, allowing for the identification and examination of themes from qualitative, word-based data transparently and dependably. Thematic analysis was utilised to interpret the participants' responses, identifying relevant themes that align with the study's objectives. Coding involves using tags to mark data with specific themes, keywords, or phrases. Once the data is coded, it is then grouped into categories based on these codes. Grouping coded data helps to organise and highlight the diversity within the data, allowing patterns and themes to emerge more clearly.

5.5.1 Perceived Sustainability of Packaging

Figure 5: Graph Depicting Number of Participants Perceiving Product Packages as Most Sustainable

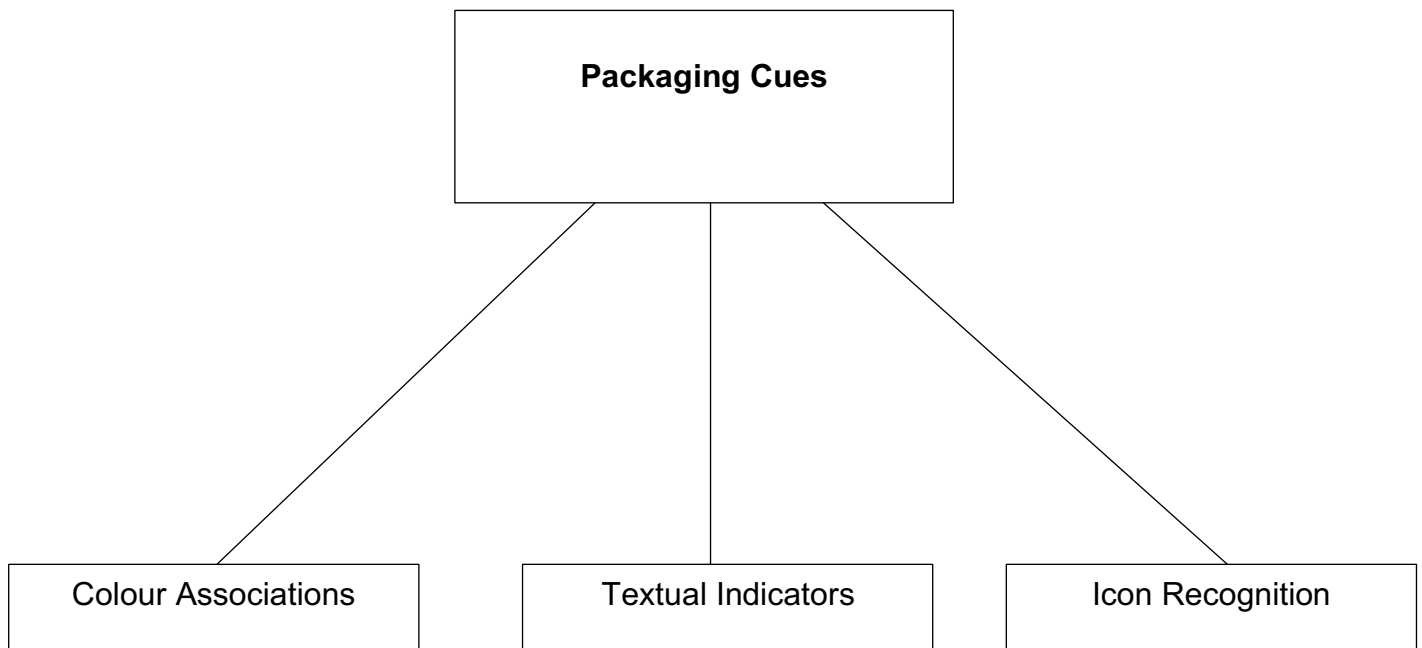


Based on the provided graph, the three elements that stand out the most to the participants as being perceived as sustainable are the Recycle Icon (37.8%), the FSC Icon (25.6%), and the Vegan Icon (18.9%). The Recycle Icon is overwhelmingly viewed as the most sustainable, thereby suggesting that the participants strongly associate this symbol with environmental responsibility. The FSC Icon also has a significant impact, thus indicating that it is widely recognised and trusted as a marker of sustainability. Additionally, the Vegan Icon is perceived by a notable portion of participants as a symbol of sustainability, reflecting its effectiveness in communicating eco-friendly practices.

The packaging of milk products significantly influences their perceived sustainability and market value. As consumers become more conscious of the environmental impacts, they prefer packaging that is compact, convenient, and eco-friendly. The materials that fulfil these criteria while preserving the product's functionality and appeal gain a competitive advantage in the market (Boz, Korhonen, Koelsch & Sand, 2020). This theme encompasses how the participants perceive and interpret various sustainability indicators on packaging, particularly focusing on which packages they view as the most sustainable and their reasons. The thematic analysis identified three main categories within this theme: icon recognition, colour associations, and textual indicators.

In analysing the responses of the 90 participants regarding which package they perceive as the most sustainable and why, several distinct themes emerged. The most frequently cited reason was the presence of the Recycling Icon. This was followed by the FSC Icon, which some participants highlighted, showing a preference for the recognised certifications that imply environmental responsibility. The Vegan Icon was the primary indicator for some participants, thus reflecting a significant concern for the plant-based and the animal-free attributes in sustainable packaging. In terms of colour associations, Beige was chosen by a few participants for its natural and earthy connotations, while Green was favoured by other participants due to its universal symbol of nature and eco-friendliness. Brown was less frequently mentioned, with limited participants perceiving it as being indicative of sustainability. The textual indicators were less commonly the primary reason, with Plant-based and Dairy-free being noted by only two and one participant, respectively.

Figure 6: Packaging Cues



5.5.1.1 Colour Association

The participants frequently linked certain colours with sustainability, thus indicating that colour choice greatly affects their perception of a product's environmental impact. Green, in particular, is universally associated with nature and environmentalism and it is commonly used to denote that a product is sustainable or has a reduced environmental impact. One participant mentioned that green is connected to nature and suggested that a brighter green is needed to stand out. Another participant noted that green has always been tied to sustainability, adding that while vegan symbols do not necessarily mean more sustainability to them, green represents a more universally recognised recycling element.

Beige is seen as a natural colour, representing minimally processed materials and enhancing the perception of sustainability. For instance, two participants commented on the following:

"Beige looks like it's made from natural materials, giving it a sustainable feel". (Participant 37)

"The beige colour suggests recyclable materials and a natural, eco-friendly approach". (Participant 9)

Brown is associated with earthy and natural tones, hence conveying a message of being organic and environmentally friendly. One participant noted that brown packaging gives an earthy feel, and it appears to be environmentally friendly. Another participant remarked that the packaging with less colouring is easier to recycle.

5.5.1.2 Textual Indicators

The textual labels on packaging were another key area of focus, with the participants considering how terms such as "plant-based," "vegan," and "dairy-free" influenced their perceptions of sustainability. The term "plant-based" suggests that the product is made entirely from plants and does not contain any animal products, which many consumers associate with sustainability and ethical consumption. One participant mentioned that their attention is immediately drawn to the term "plant-based." Another observed that the simplicity of the package is appealing, adding that "dairy-free" is unnecessary since it is oat milk, and noting that the term "vegan" can sometimes carry negative connotations. For instance, one participant stated the following:

"As I look at it my eyes are drawn to plant-based". (Participant 5)

"Dairy-free" indicates that the product does not contain any dairy products, which can be associated with both dietary preferences and environmental benefits. One participant remarked:

"Being dairy-free suggests it doesn't contain any animal products, making it more sustainable". (Participant 42)

5.5.1.3 Icon Recognition

The recycling icon is one of the most widely recognised symbols for sustainability. It signifies that the packaging can be recycled, which reassures the consumers about its environmental impact. The participants frequently mentioned specific icons as indicators of sustainability, highlighting the importance of recognisable symbols in conveying environmental responsibility. One participant stated that the recycling symbol provides reassurance about the environmental friendliness of the packaging and helps them identify it as sustainable. Another expressed that seeing the recycling logo leads them to believe the package will be both biodegradable and recyclable. Additionally, a participant emphasised the widespread recognition of the symbol, noting that it is generally understood to signify sustainability. For instance, the participants noted the following:

"Because a lot of packaging is important for me so the fact that it's recyclable helps". (Participant 7)

*"It has recycling logo on it and because it seems all natural".
(Participant 7)*

"They use natural products and it's recyclable so it's environmentally friendly". (Participant 12)

"The recycling logo". (Participant 17)

*"Because if a package says it's recyclable you believe that it is whilst just saying it's plant based doesn't mean it's sustainable".
(Participant 29)*

The vegan icon, often a 'V' or a leaf, signifies that the product is plant-based and free from animal products, which many associate with sustainability. One participant remarked that the vegan icon is a crucial deciding factor for them, with the blue colour suggesting a clean and sustainable image. Another participant mentioned that the "V" stands for vegan, making it an easy and clear symbol for sustainability. Additionally, another participant associated the vegan symbol with sustainable and healthy lifestyles. The participants stated:

"The vegan icon is a big decider out of the three icons. The blue colour hints at clean and sustainable image". (Participant 2)

"The symbol at the bottom of the package". (Participant 4)

"The V stands for vegan so it's shorthand and it pops out as V for vegan". (Participant 11)

"Because vegan is associated with the rest of the icons and healthy and sustainable lifestyles". (Participant 43)

The FSC icon indicates that the product comes from responsibly managed forests that provide environmental, social, and economic benefits. This certification adds an element of credibility to the sustainability claims. One participant noted that the FSC logo is associated with environmental sustainability. Another mentioned that the FSC

seems like an approved standard and could represent something significant. Additionally, a participant expressed that having an actual certifying body approve the packaging makes a substantial difference. The participants expressed this sentiment with comments such as:

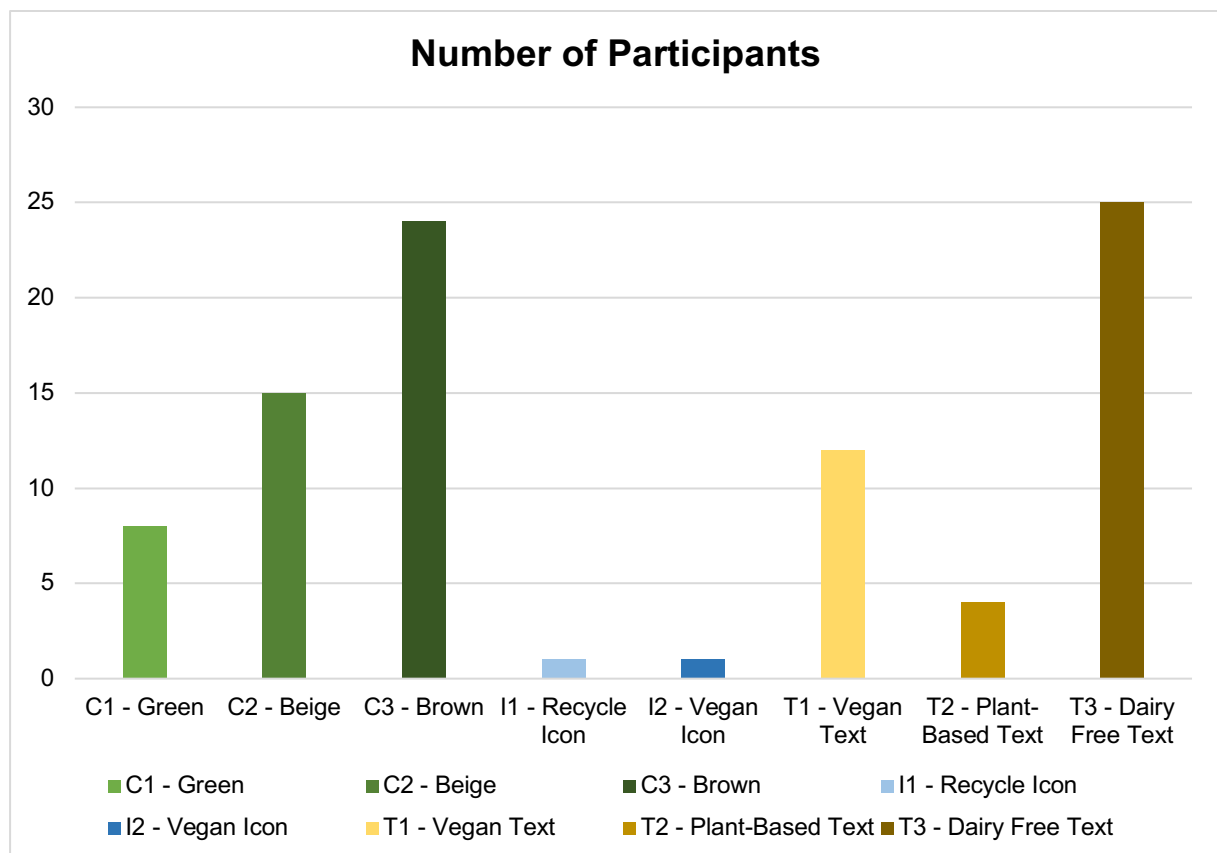
"I know FSC has to do with something with sustainability of the environment". (Participant 24)

"Because FSC seems approved, and it might be a logo for something". (Participant 72)

"Because it is actually certified by an organisation compared to greenwashing through recycling for instance". (Participant 74)

5.5.2 Ambiguity in Sustainability Communication

Figure 7: Graph Depicting Number of Participants Perceiving Product Packages as the Least Sustainable



Based on the provided graph, the three packages that the participants perceive as the least sustainable are Brown (30.4%), Dairy-Free (20.3%), and Beige (17.7%). These results indicate that a significant proportion of the participants associate the brown colour with a lack of sustainability, thus making it the most prominent indicator of unsustainability. The "Dairy-Free" label is the second most recognised element perceived as unsustainable, thus suggesting that the participants do not associate it strongly with the environmental benefits. Lastly, the beige colour is also noted by a considerable number of the participants as indicating a lack of sustainability.

The theme emerging from the participants' responses regarding which package they perceive as the least sustainable is the ambiguity in sustainability communication. This theme captures the participants' perceptions that certain packages fail to clearly communicate their sustainability credentials due to issues with colours, icons, and textual information.

5.5.2.1 Colours

The participants often highlighted that certain colours do not effectively communicate sustainability, especially those deemed as unappealing or non-earthly. Unappealing colour was frequently mentioned in relation to the beige and brown tones, which the participants found to be dull or unattractive. For instance, one participant noted that the brown colour is bland and does not evoke a sense of sustainability. The non-earthly tones, such as bright or artificial greens, were also criticised. The participants felt that these colours did not align with natural, sustainable aesthetics. One participant commented that bright green feels too artificial to be truly sustainable.

5.5.2.2 Icons

The use of icons as sustainability indicators was seen as insufficient by some participants. Insufficient icon recognition was noted where the participants felt the icons used (e.g., vegan, recycling) were either not prominent enough or did not convincingly convey sustainability. A participant mentioned that the recycling icon feels like an attempt at greenwashing, and it is not very convincing.

5.5.2.3 Textual Information

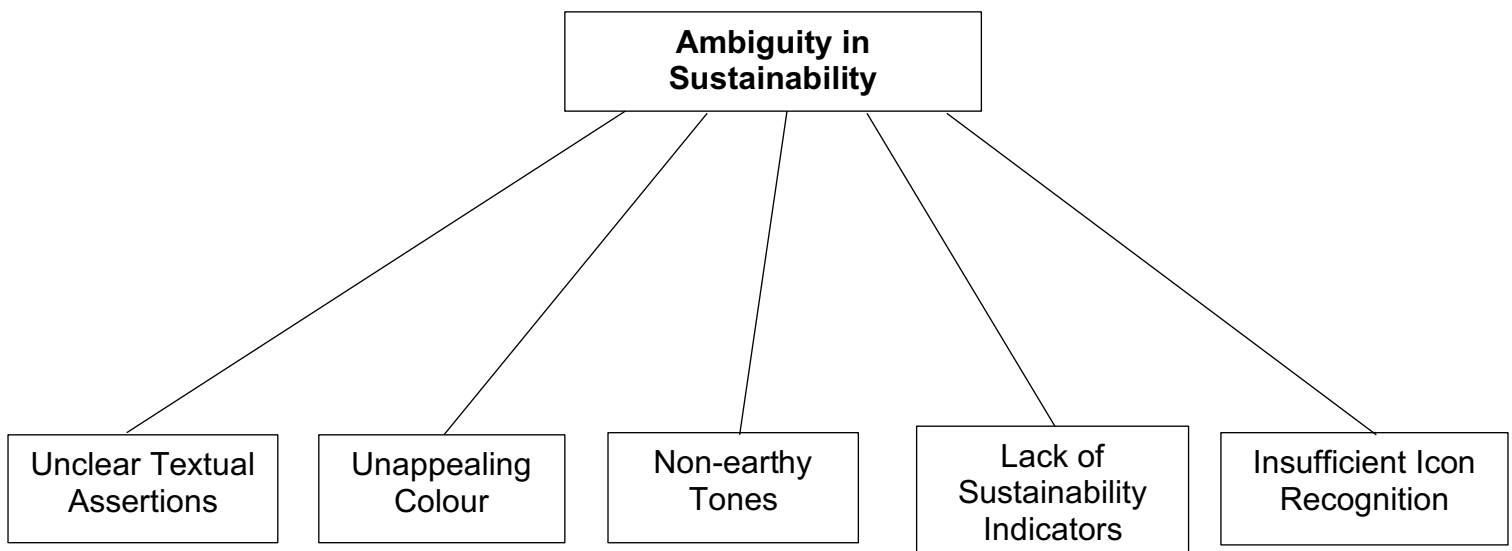
The participants also critiqued the textual information on the packaging. Unclear textual claims were a common point of contention. Texts such as "vegan" or "dairy-free" were seen as ambiguous or insufficient indicators of sustainability. One participant stated that just because a product is labelled as dairy-free it does not mean that it is sustainable.

5.5.2.4 General Ambiguity

A significant number of the participants expressed that the packaging lacked clear sustainability indicators altogether. The lack of sustainability indicators was a recurring theme where the participants felt that there were no clear signs, symbols, or texts that conveyed sustainability. For example, a participant remarked that there is nothing on the package, not even the colour or text that indicates that it is sustainable.

Therefore, the following codes emerged during the data analysis process in Figure 8.

Figure 8: Ambiguity in Sustainability



5.5.2.5 Unappealing Colour

This code captures the comments related to the aesthetic appeal of the packaging colours. The participants often felt that certain colours, especially the beige and brown tones were unattractive and did not convey sustainability. One participant noted that brown is bland, and it does not evoke a sense of sustainability, thereby suggesting that the colour brown is often associated with dullness, and it does not resonate with their perceptions of sustainable packaging. Another participant mentioned that yellow seemed quite dirty, giving off an impression of unsustainability. Some of these participants discussed the following:

*"The beige colour doesn't look natural or convey sustainability".
(Participant 74)*

"The brown colour feels unsustainable compared to green, which is more commonly associated with nature". (Participant 64)

5.5.2.6 Non-Earthy Tones

The participants criticised the colours that did not align with natural, earthy aesthetics, which they associate with sustainability. Bright or artificial greens were particularly noted. One participant remarked that the bright green feels too artificial to be truly sustainable, thus indicating that overly vivid colours may come off as inauthentic or less environmentally friendly. Another participant expressed that the green colour reminded them of cardboard, which seemed odd and did not communicate sustainability. Additionally, one participant noted that the colour itself does not convey sustainability to them, while another mentioned that the different colour, lacking symbols to suggest sustainability, fails to communicate an eco-friendly message. One participant noted that the packaging's colour, described as more digital than a natural brown earthy tone, did not evoke a sense of sustainability.

5.5.2.7 Insufficient Icon Recognition

This code addresses the perceived inadequacy of the icons meant to convey sustainability. It captures the participants' concerns about the prominence, clarity, and authenticity of these icons. Some participants felt that the icons were either not prominent enough or were misused, leading to doubts about the sincerity of the sustainability claims. For instance, one participant remarked that the recycling icon felt like an attempt at greenwashing and was not very convincing. This reflects scepticism about the genuineness of the sustainability claims suggested by such icons. The participant further mentioned that the vegan logo was not as recognisable as the other sustainability symbols, thereby failing to clearly communicate the package's eco-friendliness. Another participant remarked that although they are not vegan, the vegan icon does not convey sustainability to them. This reflects a broader scepticism about the effectiveness of certain icons in genuinely communicating eco-friendliness.

"The logo on it is kind of greenwashing me, it is not as recognisable as the other 2 logos". (Participant 5)

"I'm not vegan but I feel like it's not sustainable". (Participant 12)

5.5.2.8 Unclear Textual Assertions

This code includes comments on the textual information provided on the packaging. The participants often found terms such as "vegan" or "dairy-free" ambiguous or insufficient as indicators of sustainability. Many felt that these terms alone do not adequately communicate a product's eco-friendliness. For instance, one participant stated that just because a product is labelled as dairy-free, it does not mean it is sustainable. This highlights the need for more precise and informative textual claims regarding sustainability. Another participant remarked that while it is a given that a vegan product is dairy-free, the term vegan does not necessarily indicate sustainability. Additionally, one participant expressed that the word vegan was off-putting, or that the lack of words suggesting sustainability was problematic. One participant commented that the amount of wording on the packaging was overwhelming and detracted from the message that the package was using recycled material. Here are some of the comments:

"Because it's a given that it's dairy free. But vegan doesn't necessarily mean it's sustainable". (Participant 23)

"The word vegan puts me off". (Participant 30)

*"... There are no words that make me think it's sustainable".
(Participant 81)*

"Because it just says vegan but obviously it's vegan". (Participant 82)

5.5.2.9 Lack of Sustainability Indicators

This code captures the participants' observations about the lack of clear sustainability indicators on packaging. The participants frequently noted the absence of symbols, text, or design elements that would communicate the product's sustainability. For instance, one participant remarked that there was nothing on the package, not even the colour or text, that indicated that it was sustainable. This underscores the importance of integrating obvious sustainability cues into packaging design. Another participant felt that the packaging lacked any recycling symbols or natural tones, thereby making it difficult to perceive it as sustainable. The participants consistently mentioned that the packaging lacked specificity and clear sustainability indicators. For example, one participant expressed that the packaging was not specific enough, thus

lacking clear information about its eco-friendliness. Another highlighted the absence of recycling symbols and noted that the packaging colour seemed unnatural.

One participant mentioned that, compared to the other packages, the dairy-free labelling is harder to access and understand when producing a product. Additionally, another participant pointed out that the colour of the packaging did not appear natural and lacked logos or labels indicating that it was vegan or plant-based, thus making dairy-free and oat milk seem similar. Some participants felt that simply stating that a product is dairy-free does not imply it is environmentally friendly or good for the earth. They suggested that more explicit indicators, such as "plant-based" or "vegan," would be more effective. For instance, one noted that the term "dairy-free" might not be enough, as it could just mean lactose-free rather than genuinely sustainable. Several participants conveyed that the term "dairy-free" had more of a health connotation rather than an environmental one. They perceived products labelled as vegan or plant-based to be more sustainable compared to those labelled simply as dairy-free. One participant was particularly concerned about the absence of icons, suggesting that a lack of such symbols, combined with just the dairy-free label, could imply the use of chemicals. For instance, the participants stressed the following:

"I'd say because it's not being very specific". (Participant 10)

"Because there's no like recycling symbol. It's the most unnatural colour". (Participant 14)

"Due to the fact that compared to the other packages. Dairy free is difficult to access when making a product". (Participant 21)

"Because it the colour is not as natural, and it doesn't have the logos or say vegan or plant based. Dairy free and oat milk are kind of similar". (Participant 27)

"The other textual elements sound better for the earth because it's dairy free doesn't mean it's good". (Participant 28)

"Just saying it's dairy free isn't saying it's plant based it could just be lactose free". (Participant 45)

"The connotation of dairy free sounds more like a health thing". (Participant 49)

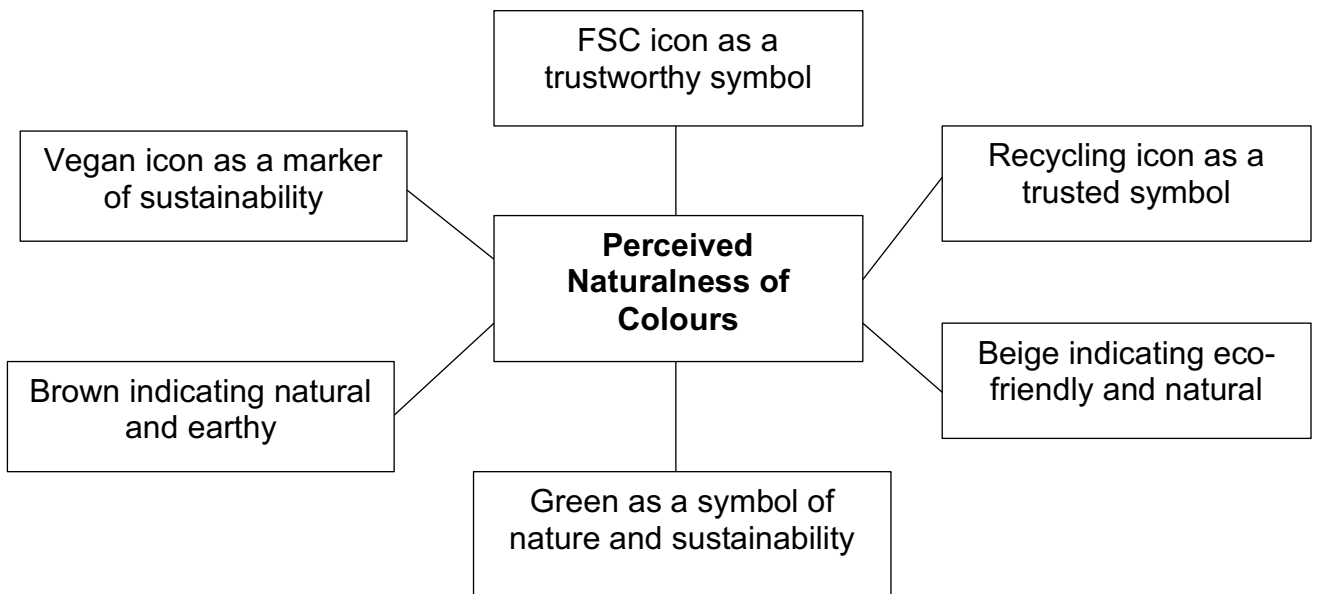
“The others are vegan, and plant based, dairy free isn’t as sustainable in my mind”. (Participant 54)

“Because it has no icon and it’s only dairy free so they could be using chemicals”. (Participant 76)

5.5.3 Perceived Naturalness of Colours

The perceived naturalness of colours in a milk product package is crucial in attracting the consumers and conveying a sense of authenticity and quality. This perception is influenced by several factors, including consumer preferences, cultural associations, and psychological effects. For example, green is often associated with freshness and nature, thereby making it a popular choice for milk product packaging. Similarly, brown can evoke feelings of warmth and earthiness, which are appealing in milk product packaging. Additionally, the beige colours can be perceived as natural and neutral, giving the packaging a clean and minimalist look.

Figure 9: Perceived Naturalness of Colours



5.5.3.1 Green as a Symbol of Nature and Sustainability

Green is frequently mentioned as a positive indicator of sustainability, associated with nature, health, and environmental consciousness. The participants find green visually appealing and reassuring in the context of eco-friendliness. For example, one participant mentioned that the green colour and recycling logo on the packaging signal sustainability and recyclability. Another participant noted that the green icons are

striking against the dark blue background, making them stand out. Comments such as "green and beige colours, along with icons, stand out" and "green colours align with eco-friendly initiatives, and brown colours also suggest sustainability" highlight how these colours and symbols are associated with environmental friendliness. Another participant stated that the green symbols make them believe that the product is healthy and environmentally friendly. Overall, green, combined with sustainability icons, effectively communicates a message of environmental responsibility and naturalness to the consumers. The participants expressed the following:

"Green icons is eye-catching against the dark blue". (Participant 3)

"Colour (green and beige) and then the ones with icons". (Participant 6)

"Colour because greener colours correlate with greener initiatives. Brown colours correlate with sustainability. And icons too". (Participant 8)

"The green and the V and the FSC. I associate that with plant-based and sustainability". (Participant 15)

"The green symbols really stick out to me because it makes me believe they're healthy and good for the environment". (Participant 54)

5.5.3.2 Beige as Eco-friendly and Natural

Beige and neutral colours are associated with minimalism and environmental consciousness. The participants perceive these colours as indicators of reduced ink use and natural materials, which align with eco-friendly values. For instance, one participant mentioned that the neutral colours suggest less ink was used, thus indicating environmental sustainability. Another noted that the natural colours and green symbols contribute to this perception. The idea that the neutral colours remind the participants of nature reinforces the eco-friendly message. Comments like "when there is not much colour, it feels like fewer resources were used" and "the beige colour resembles a cardboard box" highlight how these colours suggest a minimalistic approach to packaging, seen as being less wasteful and more sustainable. Overall, beige, and the neutral colours effectively communicate environmental responsibility and naturalness to the consumers. The participants commented on the following:

"Colour because greener colours correlate with greener initiatives. Brown colours correlate with sustainability". (Participant 9)

"The natural colours". (Participant 25)

"The colour of the whole thing. When there's not a lot of colour I feel like there's less stuff used". (Participant 57)

"This recycling symbol because of recycling. I think the colour as well. And also, what it says." (Participant 69)

"Ya so I think the brown and the green because of earthy tones. The ones that stood out most were earthy symbols". (Participant 71)

5.5.3.3 Brown as Natural and Earthy

Brown and earth tones are positively viewed in the context of sustainability, as they are associated with natural and minimalistic packaging. The participants connect these colours with eco-friendliness and reduced environmental impact, thereby evoking the natural environment and organic materials, which enhance the perception of sustainability. Brown is frequently associated with natural and earthy qualities, thus reinforcing perceptions of eco-friendliness. The participants often mentioned brown in conjunction with other natural colours like green and beige, highlighting its role in creating an environmentally conscious image. For example, one participant noted that the plainness of brown, along with the icons at the bottom, strengthens their perception of naturalness. Another participant indicated that the green colours are linked to eco-friendly initiatives, while the brown colours are associated with sustainability. This suggests that brown is seen as a colour that embodies eco-conscious values. Additionally, the minimal use of colour is perceived as an indication of resource efficiency, as one participant stated that a lack of colour implies less resource usage. The recycling symbol, combined with brown, reinforces the message of sustainability. Overall, the use of brown in packaging effectively conveys a sense of naturalness and environmental responsibility to the consumers.

5.5.3.4 Recycling Icon as a Trusted Symbol

The recycling icon is widely regarded as a trusted symbol of sustainability. The participants consistently mentioned the recycling logo as a clear indicator of a product's recyclability and environmental friendliness. The green colour combined with the recycling logo effectively communicates sustainability and recyclability. The

universally recognised recycle logo, along with other sustainability icons such as the vegan icon, strengthens the perception of eco-friendliness. For example, one participant highlighted that the green colour and the recycling logo signal sustainability and recyclability. Another noted that the recycle logo and the vegan icon are universally known and hint at sustainability. The striking nature of the recycle logo and its universal recognition reinforces its effectiveness as a symbol of sustainability. Additionally, the participants emphasised that the recycling signs encourage environmentally conscious purchasing decisions. The presence of universally recognised stamps on packaging further aids the consumers in identifying sustainable products. Overall, the recycling icon is a powerful and trusted symbol that effectively conveys a message of environmental responsibility and sustainability to the consumers. The participants noted the following for instance:

"The recycle one is striking and the icons in general". (Participant 37)

*"The icons but recycle logo because I know it's recyclable".
(Participant 42)*

5.5.3.5 Vegan Icon as a Marker of Sustainability

In recent years, the rise of veganism and the growing consumer awareness of environmental sustainability have significantly influenced the dairy industry. As consumers become increasingly conscious of the ecological impact of their food choices, the use of vegan icons on milk product packaging has emerged as a potential strategy for signalling a brand's commitment to sustainability.

The vegan icon is recognised as a significant marker of sustainability. The participants frequently mentioned the vegan icon alongside other sustainability indicators, noting its universal recognition and association with eco-friendly practices. The vegan icon, along with the recycle logo, serves as a clear indicator of sustainable products. For example, one participant emphasised that the icons, including the vegan and the recycle logos, are universally known for their sustainability implications. Another participant highlighted that these icons signify vegan and recyclable products. The use of terms such as "plant-based" and "dairy-free" further reinforces the perception of sustainability. The green logos, often associated with sustainability, draw attention to the vegan and plant-based indicators. One participant pointed out that the green symbols represent sustainability and are closely linked with these icons. Additionally, the combination of the FSC symbols, vegan labels, and earthy tones enhances the overall eco-friendly message. Overall, the vegan icon, combined with the green logos

and related text, effectively communicates sustainability and appeals to environmentally conscious consumers. One participant commented on the following:

"The icons for sure, they hint more at sustainability. Recycle logo and vegan icon are sustainable and are universally known".
(Participant 2)

5.5.3.6 FSC Icon as a Trustworthy Symbol

The FSC logo has been widely recognised as a symbol of trust and sustainability in the consumer market, particularly in the packaging of milk products. Its presence indicates a commitment to responsible forestry practices, resonating with environmentally conscious consumers. In recent years, consumers have become increasingly concerned about the environmental impact of the products they purchase, including the dairy and milk products. The FSC logo serves as a clear signal to these consumers that the milk product packaging is sourced from responsibly managed forests. This not only contributes to the preservation of natural habitats and biodiversity but also promotes the well-being of forest communities.

The respondents generally associate the FSC logo with responsible sourcing and sustainability. The green colour, along with symbols like the 'V' and recycling icons, reinforces this perception. The comments reveal a strong link between the visual elements (like the FSC logo and green symbols) and the concepts of environmental friendliness, sustainability, and plant-based products. While the FSC logo is recognised and valued, the other green symbols (such as recycling and forest icons) are also perceived as being effective and sometimes even more easily recognisable. Overall, the FSC logo, along with other green and plant-based indicators, is seen as a reliable mark of responsible sourcing and environmental sustainability. The participants noted the following, for instance:

"The green and the V and the FSC. I associate that with plant-based and sustainability". (Participant 15)

"Definitely the green icons. It just seems more official but not necessarily the plant-based one. But the recycle one and forest one". (Participant 29)

"The green because of the environment and the little symbols I think those are the most effective because the FSC symbol I recognise it but the other 2 are easier to recognise". (Participant 46)

"I'd say the plant-based and the little green logos. When something is plant-based it is more holistic. Recycling and FSC is also a very good thing for sustainability". (Participant 73)

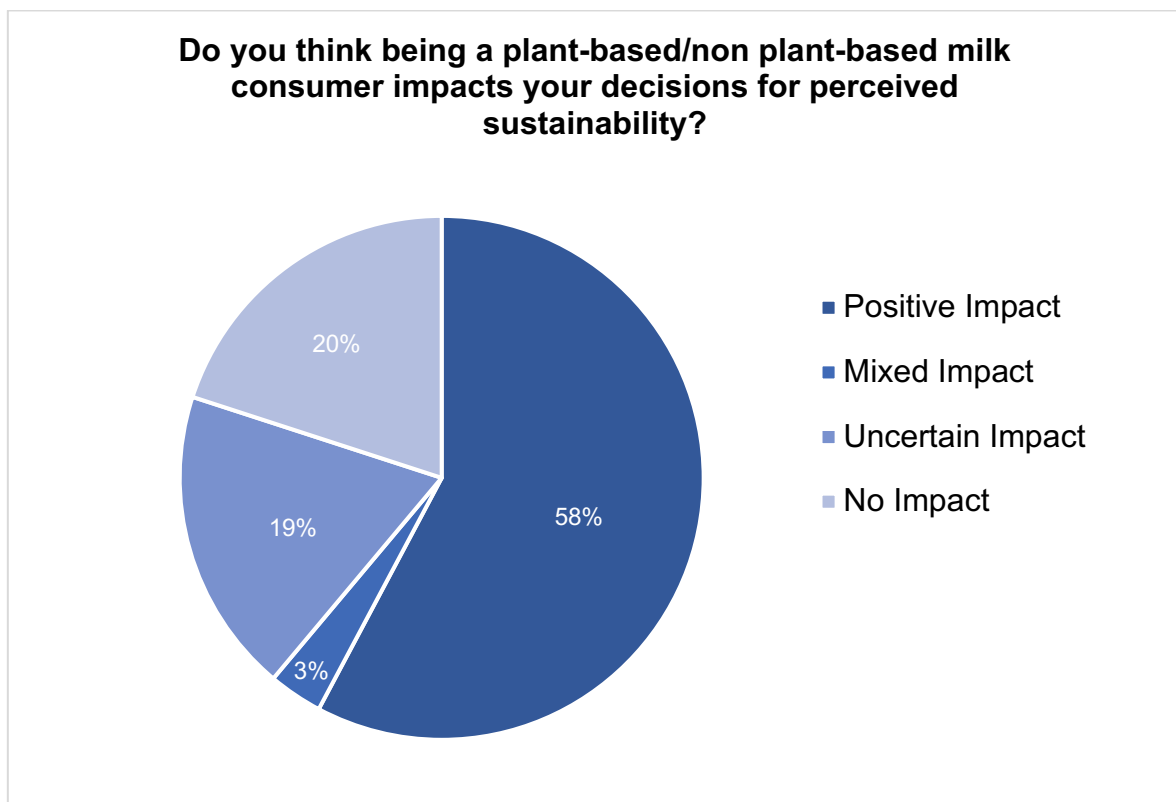
"The FSC but then also the vegan word". (Participant 78)

5.5.4 Perceptions and Influences of Sustainability in Milk Consumption Choices

The impact of milk consumption choices on perceived sustainability has gained significant attention in recent years. Consumers are increasingly aware of the environmental and ethical implications of their food choices, including milk. There is a growing recognition that milk production and consumption can have substantial environmental, social, and economic consequences (Clay *et al.*, 2019; Wattiaux, 2023).

The responses to whether being a plant-based or a non-plant-based milk consumer impacts decisions for perceived sustainability have been categorised into four main concepts: positive impact, mixed impact, uncertain impact and no impact.

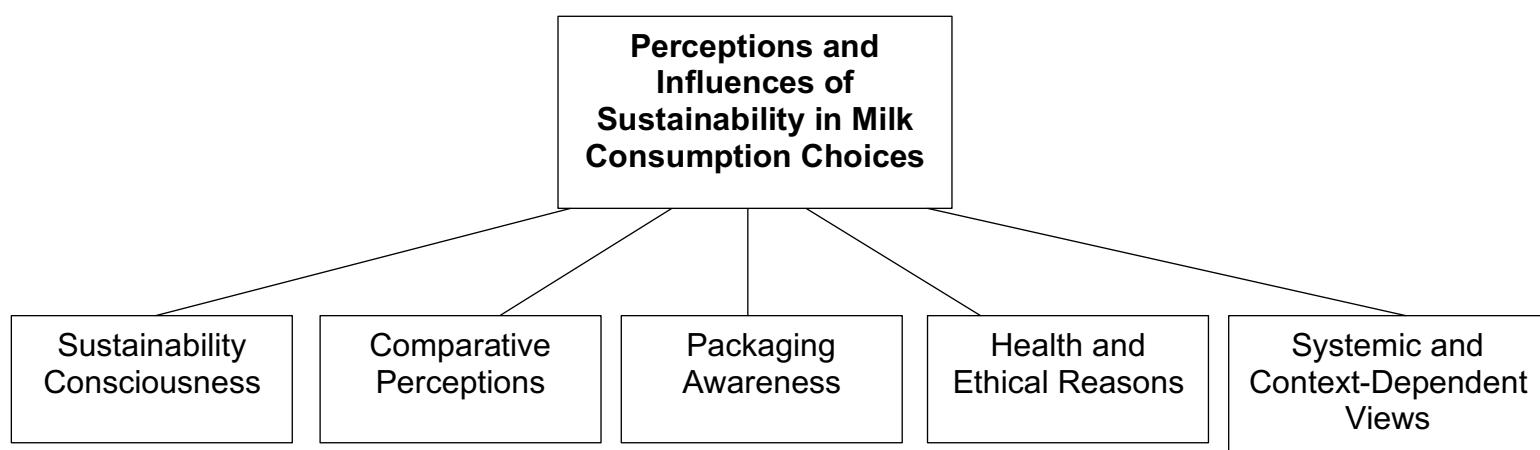
Figure 10: Graph Depicting Impacts of Decisions for Plant-Based vs Non-Plant-Based Milk Consumers



1. **Positive Impact:** A majority of the participants (52 cases) believed that being a plant-based or non-plant-based milk consumer impacts their decisions for perceived sustainability.
2. **Mixed Impact:** A small group (3 cases) had mixed views, indicating both yes and no.
3. **Uncertain Impact:** Several participants (17 cases) were uncertain, providing responses such as "Not sure," "Potentially," "Probably," "I think so," or "Maybe."
4. **No Impact:** A significant number (18 cases) did not believe that being a plant-based or non-plant-based milk consumer impacts their decisions for perceived sustainability.

The main theme captures the various dimensions covered by the codes, such as the consciousness about sustainability, health and ethical reasons, comparative perceptions, and the contextual nature of these views. It highlights how sustainability considerations influence the decisions related to plant-based and non-plant-based milk consumption.

Figure 11: Perception and Influences of Sustainability



5.5.4.1 Sustainability Consciousness

This code captures the notion that the individuals who consume plant-based milk are more likely to be aware of and considerate towards sustainability and environmental impact. This awareness often translates into making more informed choices about their food and beverage consumption. These consumers are generally perceived to have a deeper understanding of the environmental consequences of their choices and are more deliberate in selecting products that align with their values of reducing their carbon footprint and promoting sustainability.

The plant-based individuals tend to be more mindful of the origins of their food and are generally more observant about the products they select. They pay closer attention to the details, ensuring their choices align with their values. By consciously reducing their dairy intake, these consumers not only scrutinise their dairy choices but extend this thoughtful decision-making process to other dietary areas, such as meat, reflecting a holistic approach to sustainable consumption. These respondents stated the following:

"People who are plant based are more conscious of where their food comes from". (Participant 41)

"I feel like a plant-based person is more aware of what they pick up and they observe the products more". (Participant 67)

"Just because I've consciously made a choice to reduce my dairy intake. I have thought more thoroughly about my decisions - even meat too". (Participant 83)

5.5.4.2 Packaging Awareness

This code captures the emphasis that the plant-based milk consumers place on the sustainability and materials of packaging. Unlike their non-plant-based counterparts, these individuals often prioritise the environmental impact and the recyclability of packaging over other factors such as the contents or nutritional value of the product. Many plant-based milk drinkers are highly attentive to packaging, seeing it as a significant aspect of their consumption choices. For instance, some consumers express a strong preference for packaging that aligns with their environmental values. One participant mentioned that their focus is more on the packaging than the contents, highlighting that the material and sustainability cues of the packaging are crucial to their decision-making process. This indicates that for these consumers, the ecological footprint of packaging is a primary concern. Another participant noted that there is a general consensus among consumers regarding packaging, thereby suggesting that the plant-based milk drinkers are likely to think similarly about the importance of sustainable packaging. This shared perspective underscores the community's collective awareness and prioritisation of packaging sustainability. Additionally, some consumers are driven by their preferences for specific types of packaging, thus indicating that their choices are heavily influenced by how the product is packaged. For them, the decision to purchase is guided by an assessment of the packaging's sustainability rather than just the product itself. This preference underscores a broader trend among the plant-based milk drinkers who are conscientious about the environmental implications of their purchases. The participants commented the following:

"It is more about packaging than the contents". (Participant 6)

"I think we've all been told the same things. We probably think the same when it comes to packaging". (Participant 17)

"I go more towards what the packaging is made out of. For me it's about preference". (Participant 6)

5.5.4.3 Health and Ethical Reasons

This code encompasses the motivations behind choosing plant-based milk, which often include health benefits and ethical concerns, particularly animal welfare. These factors are significant drivers for the individuals opting for plant-based alternatives, reflecting a broader conscientious lifestyle. Some individuals choose plant-based milk due to allergies or intolerances, which prevent them from consuming dairy products. For instance, one participant highlighted that many people turn to plant-based options because they are allergic to certain ingredients in dairy milk, thus making plant-based alternatives a necessary dietary choice. Moreover, the health benefits are a common motivation. Many consumers believe that plant-based milk offers superior health benefits compared to dairy milk. One participant pointed out that a significant number of people drink plant-based milk primarily for health reasons. Ethical concerns, particularly related to animal welfare, are also a major factor driving the choice of plant-based milk. The ethical implications of dairy farming, especially animal cruelty, are a frequent consideration for plant-based milk drinkers. One participant noted that the issue of animal cruelty is always a consideration when drinking milk from animals.

5.5.4.4 Comparative Perceptions

This code explores the differences in how the plant-based milk drinkers and the non-plant-based milk drinkers perceive milk consumption, sustainability, and lifestyle choices. These differing perceptions highlight the varying degrees of consideration given to the environmental and ethical implications of their dietary choices.

Some non-plant-based milk drinkers perceive no significant difference between plant-based and dairy milk. For instance, one participant mentioned that milk is essentially the same regardless of whether it is plant-based or not, suggesting a viewpoint that downplays the distinctions between these options. On the other hand, the experiences and interactions with plant-based individuals can shape perceptions significantly. One participant reflected on their past experiences with vegans, noting that those who follow a plant-based diet often integrate these choices deeply into their lives. Additionally, there are doubts about the sustainability claims of the plant-based diets.

Another participant expressed scepticism about the sustainability of being plant-based, challenging the assumption that plant-based choices are inherently more sustainable. Here are examples of some of the comments:

*"Milk is just milk. It doesn't matter if you are plant-based or not".
(Participant 76)*

"Due to past experiences with vegans. They incorporate it into their lives a lot more". (Participant 46)

*"Because I don't think being plant-based is necessarily sustainable".
(Participant 3)*

5.5.4.5 Systemic and Context-Dependent Views

This code encapsulates the belief that the perceptions of sustainability are influenced by broader systemic issues or individual contexts, suggesting that personal choices alone may not significantly impact larger environmental outcomes. Some participants emphasised the importance of broader systemic factors in shaping sustainability outcomes, rather than individual consumer choices. One participant remarked that larger systemic issues are at play, and simply choosing between normal milk and dairy milk is unlikely to address these broader problems. Another perspective within this code highlights the variability in individual motivations and awareness. For instance, one participant noted that the impact of drinking plant-based milk on sustainability perceptions depends on the individual. A person might choose plant-based milk without necessarily being motivated by or being aware of the sustainability cues. For instance, the participants commented on the following:

"There are bigger more systemic things at play and choosing to have normal milk vs dairy milk is probably not going to be fixing those things". (Participant 49)

"It depends on the person. You could drink plant-based milk but not necessarily look for sustainable cues". (Participant 16)

5.6 CONCLUSION

Chapter 5 outlined the presentations of the findings of the study. It provided both the quantitative and qualitative results, and the analyses that were carried out for the

study. Descriptive statistics were presented followed by the results of the hypotheses. Subsequently, the qualitative data analyses were described, with detailed themes and quotations from respondents provided. Chapter 6 will outline the conclusions, limitations and future recommendations for the study.

CHAPTER 6: CONCLUSIONS AND RECOMMENDATIONS

6.1 INTRODUCTION

This research aimed to investigate how various cues of sustainability on product packaging influenced consumer's perception of sustainability. The following section details the summary of findings of the research study, as well as the findings correlating to each primary and secondary objectives and hypotheses. Based on the conclusions of the findings, implications, limitations, and recommendations are presented for marketing managers.

6.2 SUMMARY OF FINDINGS

The following section presents the study's findings by addressing the research objectives and it provides relevant answers to the overarching research question which is: *To what extent do the implicit cues (colour and iconography) and the explicit (textual) visual cues on product packaging which are aimed at communicating the sustainability of plant-based (oat milk) products, impact the visual attention and perceived sustainability among the young adults residing in Cape Town, South Africa?*

The findings of the paper are discussed in terms of the objectives and the hypotheses, comparing them to the findings in past literature. Some conclusions supported previous findings, whereas the others offered new insights for the research topic.

6.2.1 Primary Objective

The study aimed to determine the following research objective: *To explore the differences of the sustainability visual cues on visual attention and the perceived sustainability of oat milk product packaging between the plant-based and the non-plant-based milk consumers. Specifically, the visual cues such as colour (green, beige, and brown), iconography (recycle logo, vegan logo and FSC logo), as well as textual elements ("plant-based" "vegan" and "dairy-free" copy).*

Hypothesis 1a and 1b focussed on the background colours of the product packaging and their impact on the TTFF as well as their TFD. Based on the results of the hypothesis testing, the background colour saliency did not significantly influence the TTFF as well as the total duration of fixations during the visual processing tasks.

Hypothesis 1c proposed that the sustainability icon including the recycle logo would produce higher total fixation durations than the other icons (vegan and FSC logos). The results of the hypothesis suggest that there is a statistically significant difference in the total fixation durations between the recycle logo and the other icons, thus

indicating that the type of icon viewed influences fixation durations during visual processing tasks.

Hypothesis 1d hypothesised that the TTFF would be lower for the sustainability icons compared to the other AOs such as the textual elements. This metric is valuable for analysing how quickly an individual's attention is captured (Tobii, 2023). The findings suggest that the TTFF is not significantly lower for the sustainability icons compared to the other AOs on packaging such as textual elements. This indicates that, contrary to the hypothesis, the sustainability icons may not attract quicker initial fixations compared to the textual elements related to sustainability.

Hypothesis 1e aimed to explore whether the textual elements would generate higher total fixation durations compared to the other packaging elements such as the icons. The findings suggested that the textual elements, including the vegan text, plant-based text, and dairy-free text, attract longer durations of visual attention compared to icons such as recycle icon, vegan icon, and the FSC icon.

Hypothesis 2a explored whether product packaging including sustainability icons were perceived as more sustainable than the packages without icons. The results strongly support this hypothesis. This result can be interpreted as showing that the sustainability icons are not only noticed, but they also profoundly influence consumer perception, thus aligning perfectly with the intent to be perceived as more sustainable.

Similarly, **Hypothesis 2b** aimed to unpack whether product packaging including sustainability text was perceived as more sustainable than product packaging without text. The results substantiate the claim that the textual information on the packaging considerably affects how sustainability is perceived by the consumers. This differentiation highlights that the sustainability-related text does not merely serve as an additional feature but plays a pivotal role in enhancing the perceived sustainability of a product.

6.2.2 1st Secondary Objective

The findings in this section unpack the results gained from the first secondary objective: *To assess how the plant-based milk product packaging including colour, iconography, and the text indicative of sustainability impacts the consumers distribution of visual attention.*

Hypothesis 1a, 1b, 1c, 1d and 1e all contributed to understanding how various visual cues of sustainability impact the consumers' distribution of visual attention.

Hypothesis 1a and 1b focussed on the background colours of the packages and hypothesised that more visually salient background colours (the green package) would produce lower TTFF's and higher TFD's than the other colours (blue, brown and beige). The results showed no significantly different TTFF's between the green package and the other colour packages. Additionally, there was insufficient evidence to conclude that more visually salient background colours result in higher TFD's. Overall, it appears that the background colours of the product packages do not influence the fixation durations during the visual processing tasks, thereby implying that colour does not significantly impact the consumers distribution of visual attention.

Hypothesis 1c and 1d focussed on the sustainable visual cues incorporated into the product packages. Hypothesis 1c posited that the recycle logo would produce higher TFD's than the other icons (vegan and FSC logo), while hypothesis 1d suggested that sustainability icons TTFF's to being lower than the textual elements that are on the package. The results showed that there were significant differences in the fixation durations between the recycle logo and the vegan and FSC logo, meaning that the type of icon displayed on the pack influences the consumers' distribution of visual attention. Research suggests that stimuli that are preferred are typically viewed longer, indicating higher levels of processing (Casado-Aranda *et al.*, 2023). However, longer TFD may also indicate a level of confusion among respondents (Casado-Aranda *et al.*, 2023). With that being said, the type of icon viewed may have different levels of processing due to the ease of identifiability.

Moreover, the results of Hypothesis 1d showed that the TTFF was not significantly lower for the sustainability icons compared to the other AOIs on the pack such as the textual elements. This means that the consumers' distribution of visual attention was not significantly influenced by the sustainability icons in comparison to the textual elements. This corresponds to research conducted by Bylinskii *et al* (2017), whereby textual elements or titles, imagery and paragraphs/headers are typically fixated on first and for longer than other elements on the product (Bylinskii *et al.*, 2017). Research indicates that more time is spent reading textual elements than viewing imagery (Bylinskii *et al.*, 2017).

Lastly, **Hypothesis 1e** aimed to explore whether the textual elements would generate higher TFD's compared to the other AOI's such as the sustainability icons. The results showed that the textual elements including "vegan", "plant-based" and "dairy-free" text attract longer durations of visual attention compared to the icons which provides insight into which aspects of the visual stimulus the respondent visually attends to the most (Farnsworth, 2017). Therefore, the consumers' distribution of visual attention is influenced more by the textual elements on the package.

6.2.3 2nd Secondary Objective

The findings of this section aim to explore the results from the second secondary objective: *To establish whether the plant-based milk packaging including colour, iconography, and text indicative of sustainability influences the consumers perceived sustainability.* Both quantitative and qualitative data helped to determine the results for this objective. Hypothesis 2a and 2b contributed to establishing whether the various visual cues influence the consumers perception of sustainability. Moreover, Hypothesis 3b, 3c and 3d all contributed to exploring the consumers' perception of sustainability based on various sustainability cues. Some qualitative data insights additionally helped to establish which product packages the participants perceived to be more sustainable than the others.

Hypothesis 2a proposed that product packaging including the sustainability icons would be perceived as being more sustainable than the product packaging without icons. A Chi-Square test of independence revealed a statistically significant relationship, thus indicating that the presence of sustainability icons is strongly associated with perceptions of sustainability across different categories. This is in accordance to Pieters & Wedel (2004), where research showed that images are often the primary element used to capture consumers' attention. Several eye tracking studies have also explored the influence of images on consumer attention, revealing that products with pictorial elements on them are more likely to attract consumer's attention (García-Madariaga *et al.*, 2019), which therefore aligns with this study's findings.

Hypothesis 2b hypothesised that the product packaging with sustainable textual elements would be perceived as more sustainable than the product packaging without such text. Similarly, a Chi-Square test confirmed that there was a significant association between the presence of sustainability text and the categories of perceived sustainability, thus substantiating the claim that the textual information on packaging considerably influences consumers perception of sustainability. This differentiation highlights that the sustainability-related text is not just an additional feature but plays a pivotal role in enhancing the perceived sustainability of a product. This aligns with research conducted by García-Madariaga *et al.* (2019) and Granato *et al.* (2022). Their research showed that consumers who are highly involved in their purchase decisions assess textual information more consciously and are therefore more reliant on the product packaging messaging to define their purchase intentions (García-Madariaga *et al.*, 2019). Research additionally showed that consumers are seen to use explicit cues to form beliefs about the sustainability of the package produced, through a more deliberate and cognitive decision-making process (Granato *et al.*, 2022).

Hypothesis 3b hypothesised that the presence of colour would have a positive impact on the consumers' perception of sustainability. The Chi-square tests conducted to examine the impact of the presence of specific colours (Green, Beige, Brown, and Blue) on the perception of sustainability revealed statistically significant results ($p < .05$ for all colours), strongly supporting Hypothesis H3b. Each colour, when present, was consistently associated with high rates of perceived sustainability. Notably, the slides featuring the colours Green, Beige or Brown, were predominantly perceived as sustainable, thus underscoring these colours' strong influence on sustainability perceptions. This aligns with research conducted by Granato et al (2022) and Liem, Groen and van Kleef (2022), whereby their research showed that implicit package design characterised by a "natural" appearance was believed to inherently convey notions of sustainability to a considerable number of consumers (Granato *et al.*, 2022); (Liem, Groen & van Kleef, 2022). Green, for example, is commonly associated with nature, environmentally conscious consumption, sustainability, and a healthy lifestyle. Research also indicates that sustainable products are commonly associated with dull colours such as greens, browns, and whites (Vermeir & Roose, 2020).

The absence of these colours in the dataset led to a more varied perception of sustainability, as evident from the crosstab percentages showing diverse sustainability attributes associated with non-colour elements such as dairy-free text and the FSC icon. These variations suggest that while the presence of specific colours significantly enhances the perception of sustainability, other elements also contribute to the sustainability perceptions but without the same level of definitive impact.

Hypothesis 3c hypothesised that the inclusion of the sustainability icons would positively influence the consumers perception of sustainability. The results revealed a significant association between the presence of each icon and the perception of sustainability, with p-values less than .05 for all the icons. Specifically, the presence of the recycle icon was associated with a uniformly positive sustainability perception, suggesting this icon's effectiveness in communicating the sustainability values. This correlates with research conducted by García-Madariaga et al (2019), whereby the visual elements of product packaging played a crucial role in capturing consumers initial attentional processes at the point-of-purchase, which positively impacted the overall brand recall. Similarly, the slides featuring the vegan icon were consistently perceived as sustainable, thus highlighting its effectiveness in signalling environmental friendliness. Likewise, the presence of the FSC icon was also strongly associated with the sustainability perceptions, thereby emphasising its credibility in conveying sustainable practices. These results strongly support Hypothesis 3c and suggest that strategically using these icons in visual media or product packaging can significantly shape the consumer perceptions, enhancing the recognition of sustainability features across various contexts. As a result, imagery (such as the icons)

may have outweighed or competed with information conveyed by textual cues, as stated by Llavata et al (2020).

Hypothesis 3d proposed that the inclusion of textual elements would positively influence the consumers perception of sustainability. The Chi-square test results indicated a statistically significant relationship between the presence of textual elements (vegan text, plant-based text, dairy-free text) and increased perceptions of sustainability, with all p-values reported as 0.000. These findings provide strong support for Hypothesis H3d, which posited that the textual elements positively influence the consumers' perceptions of sustainability. Specifically, the instances featuring vegan text, plant-based text, or dairy-free text were exclusively associated with perceived sustainability, illustrating the potent impact of these textual cues on sustainability perceptions. This significant association underscores the effectiveness of these textual elements in communicating the environmental benefits, which can be crucial for the product marketing strategies aimed at the environmentally conscious consumers.

Moreover, the qualitative findings show that the participants perceived the Recycle Icon (37.8%), the FSC Icon (25.6%), and the Vegan Icon (18.9%) as indicators of the most sustainable package. The Recycle Icon was overwhelmingly viewed as the most sustainable, thereby suggesting a strong association with environmental responsibility. Analysing the responses of the 90 participants, several distinct themes emerged regarding their perceptions of the most sustainable package. The most frequently cited reason was the presence of the recycling icon, followed by the FSC icon, which the participants preferred, for its recognised certifications that imply environmental responsibility. The vegan icon was the primary indicator for some participants, reflecting a significant concern for plant-based and animal-free attributes in sustainable packaging. In terms of colour associations, Beige was chosen by a few participants for its natural and earthy connotations, while Green was favoured for its universal symbol of nature and eco-friendliness. Brown was less frequently mentioned, with limited participants perceiving it as being indicative of sustainability. The textual indicators were less commonly the primary reason, with plant-based and dairy-free being noted by only two and one participant, respectively.

6.2.4 3rd Secondary Objective

This section discusses the findings of results based on the third secondary objective: *To determine the relationship between the visual attention generated by the visual sustainability cues and perceived sustainability.*

Hypothesis 3a aimed to answer this objective. Hypothesis 3a hypothesised that there was a positive relationship between the level of attention generated by the

sustainability cues (TTFF and TFD) and consumers perception of sustainability. Multinomial Logistic Regression was the recommended statistical test because it could analyse the effect of continuous predictors on a multinomial dependent variable effectively. It provided a deeper understanding of how the attention metrics influence different perceptions of sustainability. The multinomial logistic regression analysis explored the effect of the TTFF and the TFD on different perceived sustainability categories, with 'plant-based text' serving as the reference category. The findings indicated that the model including these predictors did not significantly improve the fit over a baseline model that included no predictors. This suggests that the TTFF and the TFD, as measures of attention, do not substantially influence how sustainability is perceived across the categories examined. The odds ratios $\text{Exp}(B)$ for both TTFF and TFD were close to 1 for all categories, such as the vegan text, the FSC icon, dairy-free text, vegan icon, and the recycle Icon, thus indicating no significant enhancement in the likelihood of any sustainability category being favoured over the reference category due to these attention metrics.

6.2.5 4th Secondary Objective

The findings below summarises the findings pertaining to the fourth secondary objective: *To identify the difference between visual attention and the sustainability cues on the users vs the non-users of plant-based milk.*

Hypothesis 4a and 4b both hypothesised that the plant-based milk drinkers would have significantly higher average fixation durations when observing plant-based milk product packaging as well as the sustainable visual cues compared to those who do not consume plant-based milk. The Mann-Whitney U test was utilised to assess whether there were significant differences in the fixation durations between the plant-based milk consumers and the non-plant-based milk consumers for four packaging colour categories: Blue, Green, Beige, and Brown. The results showed that there were no significant differences in fixation durations for the Blue, Beige and Brown categories. However, a significant difference was found for the Green category indicating that plant-based milk consumers had significantly lower fixation durations compared to non-plant-based milk consumers for green packaging. These results suggest that the colour of the packaging may influence the attentional engagement of the consumers depending on their dietary preferences, particularly noted in the Green packaging category. This aligns with research conducted by Feliz *et al.* (2021), where it was found that consumers perceive an alignment between eco-friendly products and green packaging, thereby fostering more favourable perceptions of the product's environmental impact (Felix *et al.*, 2021).

Moreover, the Mann-Whitney U test was similarly conducted for Hypothesis 4b. Contrary to the expectations stated in Hypothesis 4b, the statistical outcomes did not

reveal significant disparities across any categories of visual cues. These results imply that the presence of plant-based dietary habits does not influence the attention paid to the sustainability cues on product packaging, as measured by the fixation durations. The lack of significant findings suggests that both consumer groups, regardless of their dietary preferences, may have similar levels of engagement with sustainability labels. This is like the findings in the study conducted by Ischen *et al.* (2022), where it was discovered that the non-green consumers perceive implicit and explicit visual cues as equally sustainable as the green consumers do (Ischen *et al.*, 2022). This suggested that factors beyond perception, such as motivation or price, played a significant role in influencing consumer behaviour toward sustainable products (Ischen *et al.*, 2022). Moreover, other factors, such as individual interest in sustainability or the visual appeal of the labels themselves, might play a more central role in capturing consumer attention than dietary preferences alone.

6.2.6 5th Secondary Objective

The final objective was: *To evaluate the difference between the cues that communicate sustainability and the perceived sustainability of the users vs the non-users of plant-based milk.* This section discusses the results of the findings from this objective.

Hypothesis 5 aimed to determine if there would be a significant difference in the perception of product sustainability between the plant-based and the non-plant-based milk drinkers. The results signify no statistically significant difference in how sustainability is perceived across various categories such as Blue, Brown, Beige, Green, dairy-free text, FSC icon, plant-based text, recycle icon, vegan icon, and vegan text between the two groups. The Chi-square test revealed no significant association between the type of milk consumed and sustainability perceptions.

Both groups exhibited similar percentages across the sustainability categories. For instance, the plant-based milk drinkers reported 9.1% for 'Green' and 15.2% for the 'FSC Icon,' compared to 8.9% and 14% respectively for the non-plant-based milk drinkers. Despite the minor variations in the distribution of responses, such as the non-plant-based milk drinkers showing slightly higher percentages for the 'plant-based text' and the 'recycle icon,' these differences did not reach statistical significance. This suggests that the consumer perceptions of sustainability are similarly shaped regardless of their preference for plant-based or non-plant-based milk, thus indicating that other factors may be more influential in shaping the sustainability perceptions than the dietary choices alone. This coincides with findings from Su *et al.* (2019) and Dragolea *et al.* (2023). Individuals belonging to this cohort (18-27 years of age) exhibit tendencies towards eco-friendly practises, prioritise healthy food decisions and aspire for an enhanced quality of life in comparison to other generations (Su *et al.*, 2019).

This distinction is further reflected in their purchasing behaviours and attitudes toward particular concepts, as evidenced by research findings (Dragolea *et al.*, 2023). Therefore, regardless of being a plant-based milk drink, the targeted set of individuals for this study are to be conscious about sustainability.

6.2.7 Additional Findings

The qualitative results gained from the interviews conducted with the respondents as well as the word association tasks provided a deeper understanding of their feelings and insights when exposed to the OKJA milk product packages. Some of the explanations given by the respondents allowed the researcher to draw additional conclusions from the study. An abundance of responses given by the participants were based on their various beliefs of sustainability and sustainable product packaging.

To start off with, there were three themes that were drawn from which product package the respondents believed to be the most sustainable. These themes included: colour associations, textual indicators as well as icon recognition. The participants were seen to link certain colours to sustainability, which was hypothesised prior. Therefore, colour choice was seen to heavily impact the perception of a product's environmental impact. Green is universally associated with nature and the environment, and it is commonly utilised to denote that a product is sustainable or has a reduced impact on the environment. One participant noted that since green is often associated with nature and the environment, a brighter green is required to stand out on the shelf. Another participant mentioned that green is always tied to sustainability, and despite the vegan symbols being there, they do not necessarily mean more sustainable, whereas green is a more recognised recycling colour or element. The colour beige was seen by the respondents as being more "natural", thus representing minimally processed materials or often looking more cardboard like which enhances their perception of sustainability. For example, two different participants noted that, "Beige looks like it's made from natural materials, giving it a sustainable feel" and "The beige colour suggests recyclable materials and a natural, eco-friendly approach". Moreover, the colour brown was seen to be associated with natural and earthy tones, to convey a message of being good for the environment. Thus, the participants perceived both the beige and brown colours to give an "earthy" feel, and some thought that the packaging with less colouring is easier to recycle, thus making it more sustainable.

The textual elements on the packaging were another key area of focus. What is important to note for this research, is that during the experiment, numerous participants did not even recognise the textual changes, since they would slightly differ on the package, and they were not enlarged. However, the textual elements "plant-based", "vegan" and "dairy-free" were seen to influence their perceptions, particularly during the A/B task. The term "plant-based" indicated to the respondents that the

product is made entirely by plants, and does not contain any animal products, which many associated with sustainability and ethical consumption. One participant mentioned that their attention was immediately drawn to the term “plant-based”. Another observed that the term “dairy-free” was unnecessary, since it is oat milk, as well as noting that the term “vegan” can sometimes carry negative connotations.

The recycling icon is one of the most widely recognised symbols for sustainability. It signifies that the packaging can be recycled, which in turn reassures the consumers about the product’s sustainability. The participants frequently mentioned that specific icons portrayed sustainability, thus highlighting the importance of recognisable symbols in conveying environmental sustainability. One participant mentioned that the recycling symbol provides reassurance about the environmental friendliness about the packaging, thereby helping them to perceive it as being more sustainable. Another respondent expressed that the recycle logo leads them to believe that it is biodegradable and recyclable. Moreover, a participant emphasised the widespread recognition of the symbol, noting that it generally signifies sustainability. The vegan icon, which is often portrayed as a “V” with a leaf, signifies that the product is plant-based and free from animal products, which many participants associated with sustainability. One participant mentioned that the vegan icon was a crucial deciding factor for them, with the blue package suggesting a clean and sustainable image. Another participant mentioned that the “V” stands for vegan, thus making it an easy and clear symbol for sustainability, which is associated with sustainable and healthy lifestyles. On the other hand, the FSC logo was not as widely recognised compared to the other two symbols. The FSC icon indicates that the product comes from responsibly managed forests that provide social, economic and environmental impacts. It is often found on the back of product packages, thus for the purpose of this investigation, the aim was to see whether the participants perceived the product to be more sustainable when viewing the product. One participant noted that the FSC logo was associated with environmental sustainability, whilst another mentioned that the FSC icon seemed like an approved standard and could represent something significant. Additionally, another participant claimed that having an actual certifying body approve the packaging makes a big difference.

On the other hand, the participants were asked which package they perceived to be the least sustainable. Based on the responses, the three elements that were perceived to be the least sustainable were Brown (30.4%), Dairy-Free (20.3%), and Beige (17.7%). These results indicate that a significant proportion of the participants associate the brown colour with a lack of sustainability. The participants highlighted that certain colours do not effectively communicate sustainability in their mind, especially the colours that are deemed as unnatural or non-earthly. “Unappealing colour” was frequently mentioned in the word association task in relation to the beige and brown package, since the participants found these colours to be quite dull and

boring. Non-earthly tones such as bright or artificial greens were also criticised. Moreover, the use of icons as sustainability indicators was seen as being insufficient by some participants, as some believed that the icons that were used were not prominent enough or did not convincingly portray sustainability. One participant mentioned that the recycling icon feels like an attempt at greenwashing, and it was not very convincing. Some participants also critiqued the general information on the packaging. Texts such as "vegan" or "dairy-free" were seen as being ambiguous or as insufficient indicators of sustainability. A participant stated that just because a product is labelled as being dairy-free, it does not mean that it is sustainable.

Lastly, when asking the participants whether being a plant-based milk drinker impacts decisions for sustainability, their responses varied. A majority of the respondents (52) believed that being a plant-based or a non-plant-based milk drinker does impact decisions for perceived sustainability. Only three respondents had mixed reviews, indicating both yes and no, 17 participants were uncertain providing responses such as "probably" or "maybe". On the other hand, 18 participants believed that being a plant-based or a non-plant-based milk drinker had no impact on the decisions for perceived sustainability. Various themes were drawn from these responses, such as: sustainability consciousness, packaging awareness, health and ethical reasons, comparative perceptions, as well as systemic and context-dependent views.

Sustainability consciousness captures the notion that the individuals who consume plant-based milk are more likely to be more conscious of what they consume and thus they are considerate towards the environment. This awareness often translates into making more informed choices about their food and beverage consumption. Thus, these consumers are generally perceived to have a deeper understanding of the environmental consequences and their choices may be more deliberate in selecting products that align with their values in reducing their carbon footprint. The respondents further believed that the plant-based individuals tend to be more mindful of the origins of their food, and they are generally more conscious and observant about the products that they buy. Consequently, they are seen to pay more attention to the details on the product, thus ensuring that they align with their values. By reducing the dairy intake, these consumer not only scrutinise their dairy choices but extend thoughtful decision makings to other dietary areas such as meat consumption, thereby reflecting their sustainable habits overall.

Packaging awareness was another key factor that was found among the respondents. It emphasises the fact that the plant-based milk consumers highly value sustainable packaging materials. Unlike the non-plant-based milk consumers, these individuals often prioritise the environmental impact and recyclability of the packaging over other factors such as the contents or nutritional information. It was seen that many plant-based milk drinks are highly attentive to packaging, seeing it as a significant player for

their consumption choices. One respondent mentioned that there is a general consensus among consumers regarding packaging, suggesting that the plant-based milk drinkers are likely to think similarly about the importance of sustainable packaging. Additionally, some consumers indicated that their choices are driven by the preferences for specific packaging, which indicates that they are heavily influenced by how a product is packaged. Thus, the decision to make a purchases is guided by an assessment of the package's sustainability rather than the sole product itself.

Additionally, health and ethical reasons are a major factor in influencing the consumer's purchase decisions. These factors were seen to be significant drivers for the individuals opting for plant-based alternatives, reflecting a broader conscientious lifestyle. Some individuals choose plant-based milk due to allergies or intolerances, for instance, one participant mentioned that many people use plant-based milk as they cannot consumer dairy products, thus making it a necessary dietary choice. Moreover, the health benefits are a common motivation for consumers, since many individuals believe that plant-based milks offer superior benefits compared to dairy milk. Ethical concerns are another factor, especially relating to animal welfare. Ethical implications that are tied to dairy farming, especially animal cruelty are a frequent consideration for plant-based milk consumers.

Comparative perceptions was another theme that arose, exploring the differences in how the plant-based milk drinkers and the non-plant-based milk drinkers perceive milk consumption, sustainability and lifestyle choices. These differing perceptions highlight the varying degrees of consideration given to the environmental and ethical implications of their dietary choices. One participant, for example, pointed out that there is essentially no difference in plant-based milk and dairy milk, highlighting the viewpoint that downplays the distinction between these options. However, the experiences and interactions with plant-based milk individuals shapes perceptions significantly, where one participant reflected on their past experience with vegans noting that those who follow a plant-based diet often integrate these choices deeply into their lives. Additionally, there are doubts about the sustainability claims of plant-based diets. Another participant expressed scepticism about the sustainability of being plant-based, challenging the assumption that plant-based choices are inherently more sustainable.

Systemic and context-dependent views was the final theme drawn from this question. This theme encapsulates the belief that the perceptions of sustainability are influenced by broader systemic issues or individual contexts, suggesting that personal choices alone may not significantly impact larger environmental outcomes. Some participants emphasised the importance of broader systemic factors that shape sustainability outcomes, rather than individual choices. A participant remarked that larger systemic issues need to be taken into consideration, and simply choosing between normal dairy

milk and plant-based milk is unlikely to address broader problems. Another perspective is that there are individual motivations and awarenesses. For instance, one participant noted that the impact of drinking plant-based milk on sustainability depends on the individual. A person may choose plant-based milk without necessarily being motivated or aware of its sustainability.

6.3 PRACTICAL MANAGERIAL IMPLICATIONS AND RECOMMENDATIONS

Marketing managers constantly strive to gain consumers' attention and to maintain customer relationships. By understanding the consumers' unconscious minds, marketers can devise effective marketing strategies to achieve specific market-related goals. Consumer neuroscience technology enables researchers to explore consumers' unconscious thoughts in depth. The results from this study provide valuable insights into the visual attention process concerning various product packaging leading to several managerial implications that can be utilised by the marketers as well as researchers in developing future research strategies.

Eye tracking metrics assist researchers in identifying the visual attention processes in the individuals. By focussing on product packaging, researchers can determine which elements attract consumers the most. These metrics can be further utilised to not only understand which elements are attracting consumers for product packages, but also which elements in advertisements or in marketing messages effectively emphasise product information or the intended message. For instance, a sustainable company may want to investigate which marketing messages in their advertisements stand out and attract the most attention for consumers. They could consequently utilise eye tracking technology to inform their decisions by identifying which elements capture consumers' visual attention, ultimately aiding in sustainable practises.

Furthermore, the results of the present study attempted to operationalise eye tracking metrics and consumers' perception of sustainability. The findings of the study indicated that the TTFF and the TFD as measures of attention, significantly influence how sustainability is perceived across the examined categories. Thus, it is crucial for marketers to recognise that there is a likelihood of consumers perceiving products as being sustainable with regards to the visual cues on the product packages. Thus, it is extremely important for marketers to understand the consumers' perceptions of sustainability as well as their attentional processing for specific elements they would want to utilise on product packages.

6.4 LIMITATIONS OF THE STUDY

This section outlines the key limitations of the study relating to the sample, data collection, product packaging and the technology utilised.

The first limitation was the smaller sample size that was acquired for the study. Initially, the aim was to acquire 65-70 respondents for the study, since at least 30 participants per test group are typically required in studies. However, after reviewing the results from the study, it was found that there were only 10 plant-based milk drinkers that completed the study. Consequently, an additional 20 participants were recruited, resulting in a total of 90 participants. Given the time constraints and limitations, a larger sample size would have yielded a more robust study. Data collection was restricted over the period of the 18th of March – 15th of April, as a room in the Menzies building at UCT Upper Campus was reserved only during that time. This time constraint limited the number of participants who could participate in the study. Additionally, this study was confined to consumers living in Cape Town, South Africa, which limited the geographic diversity of the participants. The study also focussed on consumers between the ages of 18-27 years, which restricts the findings to a single age group, rather than exploring the results across different generational cohorts.

Moreover, the study solely focused on one milk product brand: *OKJA*. Consequently, the data generated was limited to this specific product packaging along with the visual modifications used. Utilising various oat milk product packaging, or various plant-based milks, may provide more generalised results across the target population. Additionally, each product packaging only incorporated one visual cue modification on the packaging, which could be limiting in terms of understanding whether different visual cues combined could produce the best results.

Furthermore, eye tracking was the sole neuromarketing research tool that was utilised in the study. While eye tracking technology effectively analyses consumers' visual attentional processing using metrics such as total fixation durations or time to first fixations, additional neuroscience tools could have provided more robust data and insights into visual attention as well as perceptual processing. Tools such as the FAC, GSR fNIRS or FMRI could have been used alongside eye tracking to give a more comprehensive understanding of the attentional processes.

Despite these limitations, the present research achieved its objectives, thus providing useful insights and a better understanding of the visual attentional processing of various visual cues portrayed on the milk product packaging. Additionally, these limitations provide recommendations for future research, which are discussed subsequently.

6.5 FUTURE RESEARCH RECCOMENDATIONS

This section outlines the recommendations for future research with regards to the visual attention of the current study. Since the findings targeted the individuals between the ages at 18- and 27-years old residing in Cape Town, South Africa, future research should focus on more population groups, including Generation X and Y.

Comparing responses across different generational cohorts could provide more comprehensive insights with regards to generational perceptions of sustainability as well as attentional processing. Additionally, extending the study to other cities across South Africa, such as Johannesburg, is recommended to acquire results from different geographic regions. Conducting the research with a larger sample size would also enhance the robustness of the findings as the current study faced time and budget constraints.

The current study exclusively utilised *OKJA* oat milk product packaging, thus limiting the scope of the data. Future research should incorporate additional oat milk product packages to gain more insights into consumers' perception of sustainability across a variety of brands along with the modified visual cues of sustainability. Furthermore, incorporating multiple visual cues on the product packaging could help to determine which various elements collectively generate the most sustainable perception among the respondents.

Additionally, future research could explore other factors, such as how smart labels, QR codes, and intelligent packaging influence visual cues and consumer attention, potentially using eye-tracking technology. This opens up exciting avenues for further investigation in this area of study.

Lastly, eye tracking technology was the sole neuromarketing tool utilised for the present study. Future research should consider utilising additional neuromarketing tools to capture the respondents' visual attention processing more comprehensively. Tools such as Facial Action Coding (FAC), Galvanic Skin Response (GSR), functional Near-Infrared Spectroscopy (fNIRS), or functional Magnetic Resonance Imaging (fMRI) could provide more detailed insights into the attentional processes.

6.7 CONCLUSION AND SUMMARY

This paper explored how various cues of sustainability on oat milk product packaging influenced consumer perceptions of sustainability. This chapter summarised the findings of the data analysis, addressing both the primary and secondary objectives as well as the hypotheses tested. Based on these findings, the chapter provides implications, limitations and the recommendations for marketing managers.

To summarise the key findings of the hypotheses, background colour of the product packages did not significantly influence the TFF and TFD during visual processing tasks. However, in terms of icons, there was a statistically significant difference in TFD between the recycle logo and other icons, which indicates that the type of icon viewed influences fixation durations during visual processing. Moreover, TFF was not significantly lower for sustainability icons compared to other AOs on packages such as textual elements. Thus, these icons may not attract quicker initial fixations

compared to textual elements related to sustainability. On the other hand, Textual elements, including Vegan Text, Plant-based Text, and Dairy-free Text were seen to attract longer durations of visual attention compared to icons such as Recycle Icon, Vegan Icon, and FSC Icon.

Moreover in terms of perception of sustainability, sustainability icons were not only noticed, but were seen to profoundly influence consumer perception, aligning perfectly with the intent to be perceived as more sustainable. Additionally, textual information on packaging considerably affected how sustainability was perceived by consumers. Results from the hypotheses also indicated that that TTF and TFD, as measures of attention, did not substantially influence how sustainability was perceived across the categories examined. In terms of icons and textual elements, the results revealed a statistically significant association between the presence of each icon and the perception of sustainability

Furthermore, results of hypothesis 4 showed that there were no significant differences in fixation durations for the Blue, Beige and Brown categories. However, a significant difference was found for the Green category, indicating that plant-based milk consumers had significantly lower fixation durations compared to non-plant-based milk consumers for green packaging. These results suggest that the colour of the packaging may influence the attentional engagement of consumers depending on their dietary preferences, particularly noted in the Green packaging category. Moreover the presence of plant-based dietary habits does not influence the attention paid to the sustainability cues on product packaging, as measured by the fixation durations. The lack of significant findings suggests that both consumer groups, regardless of their dietary preferences, may have similar levels of engagement with sustainability labels. Lastly, there was no statistically significant difference in how sustainability is perceived across various categories such as Blue, Brown, Beige, Green, dairy-free text, FSC icon, plant-based text, recycle icon, vegan icon, and vegan text between the two groups.

Overall, the goal of this research is to assist both marketers and researchers in understanding which implicit and explicit visual elements on product packaging influence consumers visual attention and shape their perception of sustainability. The findings reveal that while various visual cues influence consumer attention, perception of product sustainability can differ. It is of crucial for marketing practitioners and researchers to grasp the impact both conscious and subconscious consumer decisions.

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LIST OF APPENDICES

APPENDIX A: Ethics and DSA Approval, Cover Letter, Proof of Statistician and Language Editor

Figure 1.1: Ethics Approval



2024/01/25

COM/00563/2024

RE: Research Ethics Committee Project Approval Letter

Dear Kathryn Wahl,

Your application for ethics review of your project titled

Unpacking the Effect of Sustainable Milk Packaging on Consumer Attention by Incorporating Eye Tracking Technology

has been reviewed and evaluated by the

Commerce Research Ethics Committee.

You may proceed with your research project titled:

Unpacking the Effect of Sustainable Milk Packaging on Consumer Attention by Incorporating Eye Tracking Technology

Please note that should:

- (i) any serious or adverse effects to participants occur and/or,
- (ii) aspect(s) of your current project change and/or
- (iii) any unforeseen events that might affect continued ethical acceptability of the project occur then you should immediately report this to the approving REC. You may be required to submit an amendment to this application, in order to determine whether the changed aspects increase the ethical risks of your project.

Based on the information supplied your application has been successful and is approved.


Please note the following additional conditions associated with this approval:

- (i) * DSA approval must be sought before commencing with the study

Regards,

Commerce Research Ethics Committee.

Figure 1.2: DSA Approval

	RESEARCH ACCESS TO STUDENTS	DSA100
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NOTES

- This form must be FULLY completed by all applicants who want to access UCT students for the purpose of research or surveys.
- Return the fully completed (a) DSA 100 application form by email, in the same word format, together with your: (b) research proposal inclusive of your survey, (c) copy of your ethics approval letter / proof (d) informed consent letter to: Nadierah.Pienaar@uct.ac.za. Your application will be attended to by the Executive Director, Department of Student Affairs (DSA), UCT.
- The turnaround time for a reply is approximately 10 working days.
- NB: It is the responsibility of the researcher/s to apply for and to obtain ethics approval and to comply with amendments that may be requested; as well as to obtain approval to access UCT staff and/or UCT students, from the following, at UCT, respectively:
 - Ethics: Chairperson, Faculty Research Ethics Committee' (FREC) for ethics approval, (b) Staff access: Executive Director: HR for approval to access UCT staff, and (c) Student access: Executive Director: Student Affairs for approval to access UCT students.
- Note: UCT Senate Research Protocols requires compliance to the above, even if prior approval has been obtained from any other institution/agency. UCT's research protocol requirements applies to all persons, institutions and agencies from UCT and external to UCT who want to conduct research on human subjects for academic, marketing or service related reasons at UCT.
- Should approval be granted to access UCT students for this research study, such approval is effective for a period of one year from the date of approval (as stated in Section D of this form), and the approval expires automatically on the last day.
- The approving authority reserves the right to revoke an approval based on reasonable grounds and/or new information.

SECTION A: RESEARCH APPLICANT/S DETAILS

Position	Staff / Student No	Title and Full Name	Contact Details (Email & Cell / Land line)
A.1 Student Number	WHLKAT003	Miss Kathryn Nicole Wahl	WHLKAT003@myuct.ac.za / 0727616305
A.2 Academic / PASS Staff No.			
A.3 Visitor/ Researcher ID No.			
A.4 University at which a student or employee	UCT	Address if <i>not</i> UCT:	
A.5 Faculty & Department/School	Commerce Faculty, School of Management Studies - Marketing		
A.6 APPLICANTS DETAILS If different from above	Title and Name	Tel.	Email

SECTION B: RESEARCHER/S SUPERVISOR/S DETAILS

Position	Title and Name	Tel.	Email
B.1 Supervisor	Mr Pragasen Pillay	0216505909	p.pillay@uct.ac.za
B.2 Co-Supervisor/s	Mr Ashraf Vahed	0785112786	ashraf.vahed@neuralsense.com

SECTION C: APPLICANT'S RESEARCH STUDY FIELD AND APPROVAL STATUS

C.1 Degree – if applicable	Master in Business Science Marketing
C.2 Research Project Title	Unpacking the Effect of Sustainable Milk Packaging on Consumer Attention by Incorporating Eye Tracking Technology
C.3 Research Proposal	Attached: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
C.4 Target population	UCT students aged between 18 and 27 years
C.5 Lead Researcher details	If different from applicant:
C.6. Will use research assistant/s	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> If yes- provide a list of names, contact details :
C.7 Research Methodology and Informed consent	Research methodology: Mixed method approach, utilising both quantitative eye tracking data and qualitative data from the interview conducted thereafter. Informed consent: Yes, required from participants
C.8 Ethics clearance status from UCT's Faculty Ethics in Research Committee /Chair (EIRC)	Approved by the UCT EIRC: Yes <input checked="" type="checkbox"/> With amendments: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> (a) Attach copy of your UCT ethics approval. Attached: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> (b) State date / Ref. No / Faculty of your UCT ethics approval: 25/01/2024 Ref. / Faculty: COM/00563/2024

**SECTION D: APPLICANT/S APPROVAL STATUS FOR ACCESS TO STUDENTS FOR RESEARCH PURPOSE
(To be completed by the ED, DSA or NOMINEE)**

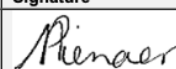

D.1 APPROVAL STATUS	Approved / With Terms / Not	* Conditional approval with terms	Applicant/s Ref. No.:
	(i) Approved <input checked="" type="checkbox"/>	a) Access to students for this research study must only be undertaken after written ethics approval has been obtained. b) In event any ethics conditions are attached, these must be complied with before access to students.	WHLKAT003 / Miss Kathryn Nicole Wahl
D.2 PREPARED BY:	Designation	Name	Signature
	Personal Assistant	Nadierah Pienaar	
D.3 APPROVED BY:	Designation	Name	Signature
	Executive Director / Nominee Department of Student Affairs	Mr Pura Mgolombane	
			Date of Approval
			8/02/2024
			9/02/2024

Figure 1.3: Cover Letter



To the respondent:

This research will be conducted by a Master of Business Science student specialising in Marketing at the University of Cape Town. This research aims to enhance our comprehension of the role of visual attention, thereby contributing to the refinement and robustness of neuromarketing investigations.

Participation in this study entails completing a brief screening questionnaire, followed by a **10-minute** eye tracking experiment. Subsequently, a concluding interview, lasting approximately **5 minutes**, will be conducted. In total, participation in both the experiment and interview is estimated to take around **15 minutes**. The research will take place at the University of Cape Town in a quiet room in the Menzies building. The eye tracking experiment will utilise a Tobii screen-based eye-tracking device. This is non-invasive and records eye movements from a distance. Participation is **voluntary** and responses will be kept **anonymous** and **confidential** to be used solely for the purpose of this investigation. Participants will not need to reveal personal details such as names, contact information or a physical address as this is not relevant to the study. The participants will be given a participant ID (e.g. Participant 1) to keep track of recordings. All the data captured will be kept on a password protected laptop and there will be no links back to the participants.

Eligibility for participation in the study requires individuals to fall within the age range of **18 to 27 years**. This research has been approved by the UCT Faculty of Commerce Ethics in Research committee. By participating in this study, you as a respondent: Consent to participate in this study (eye tracking experiments and interview), are aware that participation is voluntary and understand that you may withdraw from the study at any point in time without penalty.

If you are interested in participating please email: WHLKAT003@myuct.ac.za

Should you have any questions regarding the study, please do not hesitate to contact the following researcher:

Kathryn Wahl: WHLKAT003@myuct.ac.za

Supervisors:

Dr Pragasen Pillay: p.pillay@uct.ac.za

Mr Ashraf Vahed: ashraf.vahed@neuralsense.com

Your participation will be greatly appreciated.

Kind regards
Kathryn Wahl

Figure 1.4: Consent From OKJA

Good morning!

I trust this email finds you well.

My name is Kathryn Wahl, and I am currently pursuing my Masters in Business Science with a specialisation in Marketing at the University of Cape Town. As I embark on the proposal phase of my journey, I am excited to reach out to you with a unique and compelling opportunity for collaboration.

I am currently exploring potential avenues for my research study, which aims to delve into the captivating realm of consumer behaviour. Specifically, I am drawn to the interplay between visual cues on packaging and consumer attention. I will further be making use of eye-tracking technology to unveil the influence between consumers' visual engagement and the elements present on packaging.

The core objective of my study is to examine how various visual cues and textual elements strategically positioned on the packaging of plant-based milk products can influence consumer attention. I aim to create an investigation for respondents by presenting them with your brand's product packaging, unravelling the patterns of their visual attentional processes with various visual and textual components.

I would like your permission to incorporate your brand as a focal point within my research. With your consent, I intend to explore the dimensions of your original Oat Milk packaging, employing it as the foundation upon which I would manipulate and tailor distinct elements. Through this methodical process, I hope to reveal invaluable insights into the elements that inherently command consumers' visual attention, thus forging a deeper understanding of effective packaging strategies.

In return for your collaboration, I am committed to providing you with a comprehensive synthesis of my findings and discoveries.

Thank you for your consideration, please let me know if you would like more information or to be in contact with one of my supervisors. Looking forward to the possibility of working together.

Kind regards,

Kathryn Wahl, Masters in Business Science Marketing, University of Cape Town

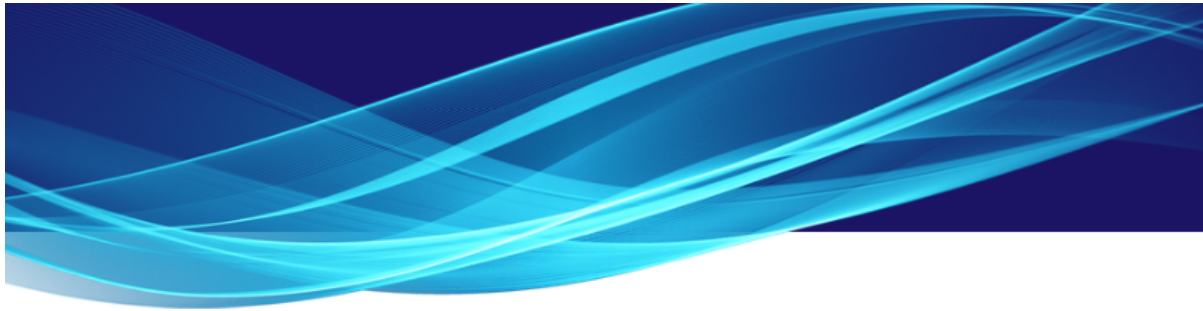
Hi Kathryn

OK great. Go for it. Interested in seeing your results!

Keep well



Figure 1.5: Proof of Statistician



DR KAREL NZITA

+27 73 743 8591
351 Ontdekkers Road, Rooderpoort
karel@osmzconsulting.co.za

This letter serves to confirm that the statistics provided in the research project titled: ***Unpacking the Effect of Sustainable Milk Packaging on Consumer Attention by Incorporating Eye Tracking Technology***, were analysed and validated by statistician. The statistical analysis rendered by the statistician encompassed data cleaning and screening, descriptive and inferential analyses, as well as report writing.

In addition to verifying the methodological correctness, we furnished detailed comments to guide the student on necessary adjustments and improve on necessary adjustments and improvements.

Sincerely,

Dr Karel Nzita



Figure 1.6: Proof of Language Editor



You Write. **We Edit.** You Love it.

1 September 2024

TO WHOM IT MAY CONCERN

RE: CONFIRMATION OF LANGUAGE EDITING SERVICES: KATHRYN WAHL

I confirm that I have done language editing for Kathryn Wahl's dissertation titled:



**UNPACKING THE EFFECT OF SUSTAINABLE MILK PACKAGING ON CONSUMER ATTENTION BY
INCORPORATING EYE TRACKING TECHNOLOGY**

The dissertation now conforms to the University of Cape Town's expected academic language editing standards.



Yours sincerely

A handwritten signature in black ink that reads "Lynn N. Sibanda Moyo". The signature is written in a cursive style and is positioned to the left of a vertical line.

Lynn N. Sibanda Moyo

Tel: 011 050 0376

Mobile: 071 989 0983

Email: lynn@lovetoedit.co.za

Member of the [Professional Editors Guild](#)



Address: 16 Countesses Ave, Randburg, South Africa, 2194 | **Telephone:** +27 11 050 0376 | **Email:** info@lovetoedit.co.za
Website: www.lovetoedit.co.za | **Registration Number:** 2016/ 425723/ 07

APPENDIX B: Sustainability Icons & Textual Claims



Figure 2.1: “Vegan” Icon. These icons are more commonly found on European plant-based milk products.



Figure 2.2: “Forest Stewardess Council” icons – indicating it is packaging made from responsible sources. These are commonly found on the back of the packaging.



Figure 2.3: Recycle” logo, also more commonly found on the back of product packaging.

Figure 2.4: Textual Claims on Plant-Based Milk



APPENDIX C: Screening Questionnaire



Kathryn Wahl WHLKAT003

Title: Unpacking the Effect of Sustainable Milk Packaging on Consumer Attention by Incorporating Eye Tracking Technology

Screening

Filter Questions

What is your age?*

- 18 - 21 years
- 22 - 24 years
- 25 - 27 years

Do you reside in Cape Town?*

- Yes
- No

Do you have any eye-related issues/problems?*

- Yes
- No

Do you consume plant-based milk regularly? i.e. do you consume it more than twice a week?*

- Yes
- No

Respondent Number

Your answer

*Must answer "Yes" to Question 1, 2 and 3 to continue with experiment.
If answered "No", to Question 1, 2 and 3 do not continue with experiment.*

APPENDIX D: *OKJA* Packaging Variations

OKJA Milk Product Packaging Variations

Figure 3.1: Colour Variations



Figure 3.2: Icon Variations



Figure 3.3: Textual Claim Variations



APPENDIX E: A/B Experimental Packaging Design

Figure 4.1: Study Design – A/B Testing

O C1	C1 O	C1 C2	C2 C1	C2 I1	I1 C2	C3 I1	I1 C3	I1 I2	I2 I1	I2 T1	T1 I2	I3 T1	T1 I3	T1 T2	T2 T1
O C2	C2 O	C1 C3	C3 C1	C2 I2	I2 C2	C3 I2	I2 C3	I1 I3	I3 I1	I2 T2	T2 I2	I3 T2	T2 I3	T1 T3	T3 T1
O C3	C3 O	C2 C3	C3 C2	C2 I3	I3 C2	C3 I3	I3 C3	I2 I3	I3 I2	I2 T3	T3 I2	I3 T3	T3 I3	T2 T3	T3 T2
O I1	I1 O	C1 I1	I1 C1	C2 T1	T1 C2	C3 T1	T1 C3	I1 T1	T1 I1						
O I2	I2 O	C1 I2	I2 C1	C2 T2	T2 C2	C3 T2	T2 C3	I1 T2	T2 I1						
O I3	I3 O	C1 I3	I3 C1	C2 T3	T3 C2	C3 T3	T3 C3	I1 T3	T3 I1						
O T1	T1 O	C1 T1	T1 C1												
O T2	T2 O	C1 T2	T2 C1												
O T3	T3 O	C1 T3	T3 C1												



Figure 4.2: Original - O



Figure 4.3: Colour – C1



Figure 4.4: Colour – C2



Figure 4.5: Colour – C3



Figure 4.6: Icons – I1



Figure 4.7 Icons – I2



Figure 4.8: Icons – I3



Figure 4.9: Text – T1



Figure 4.10: Text – T2



Figure 4.11: Text – T3

APPENDIX F: Experiment Task Instructions

Figure 5.1: Tobii Experimental Design Set Up

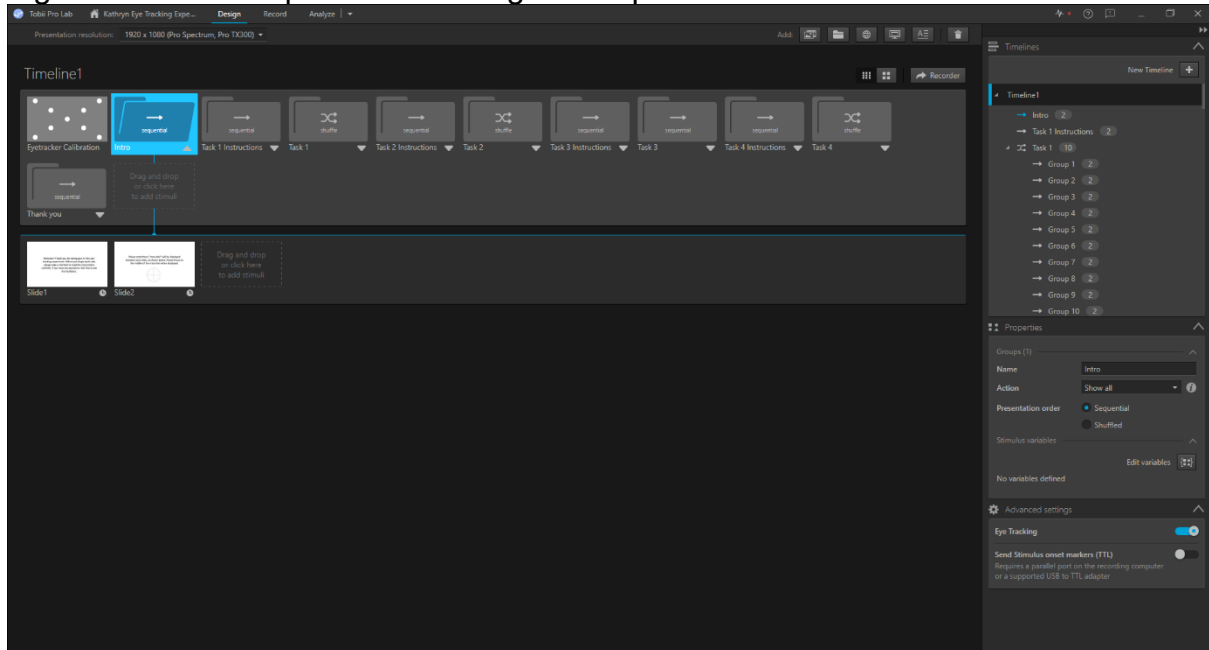


Figure 5.2: Welcome Slide for Experiment

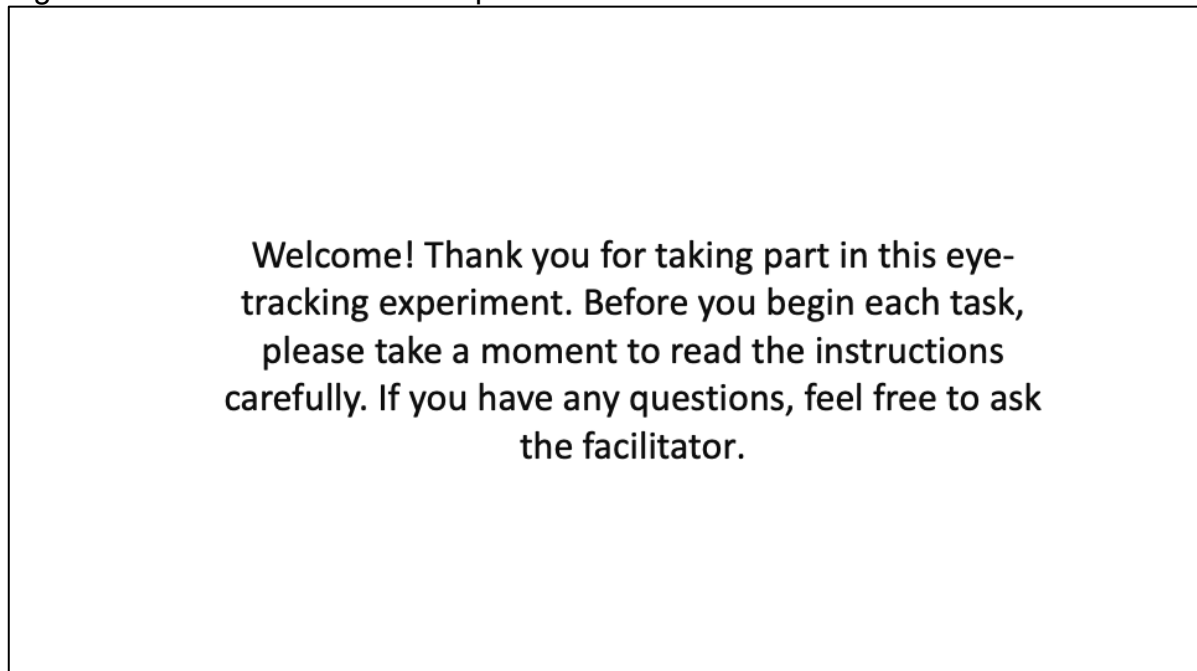


Figure 5.3: Crosshair Information

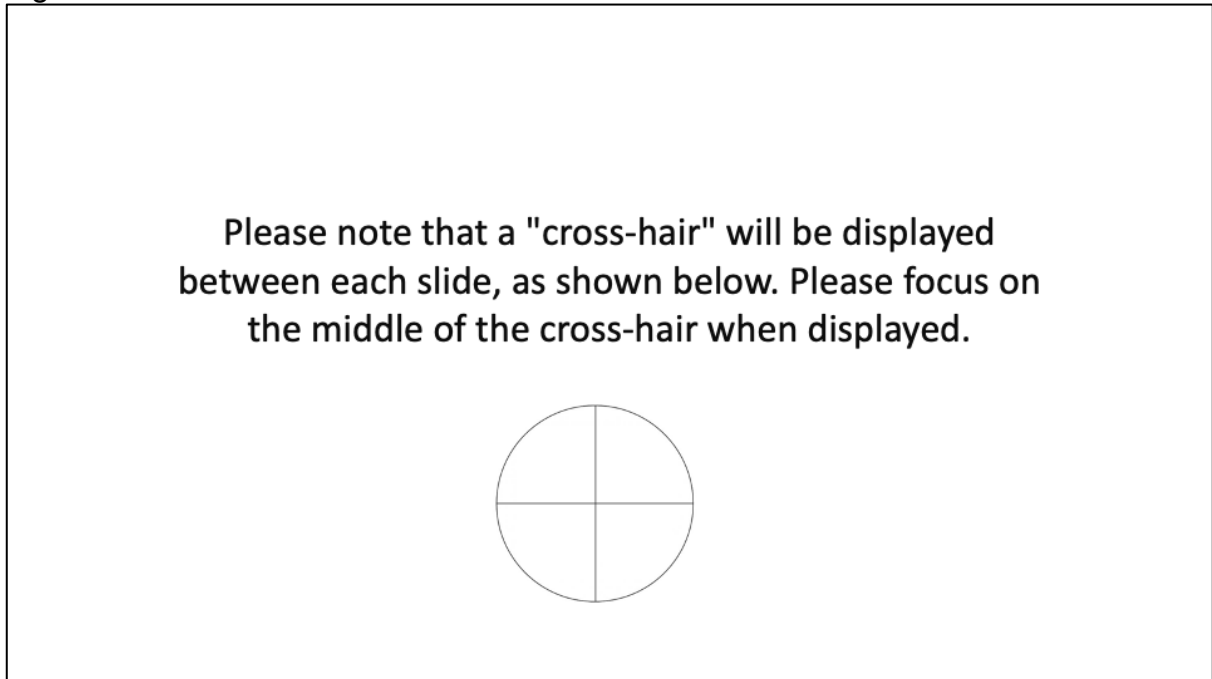


Figure 5.4: Task 1 Tobii Set Up

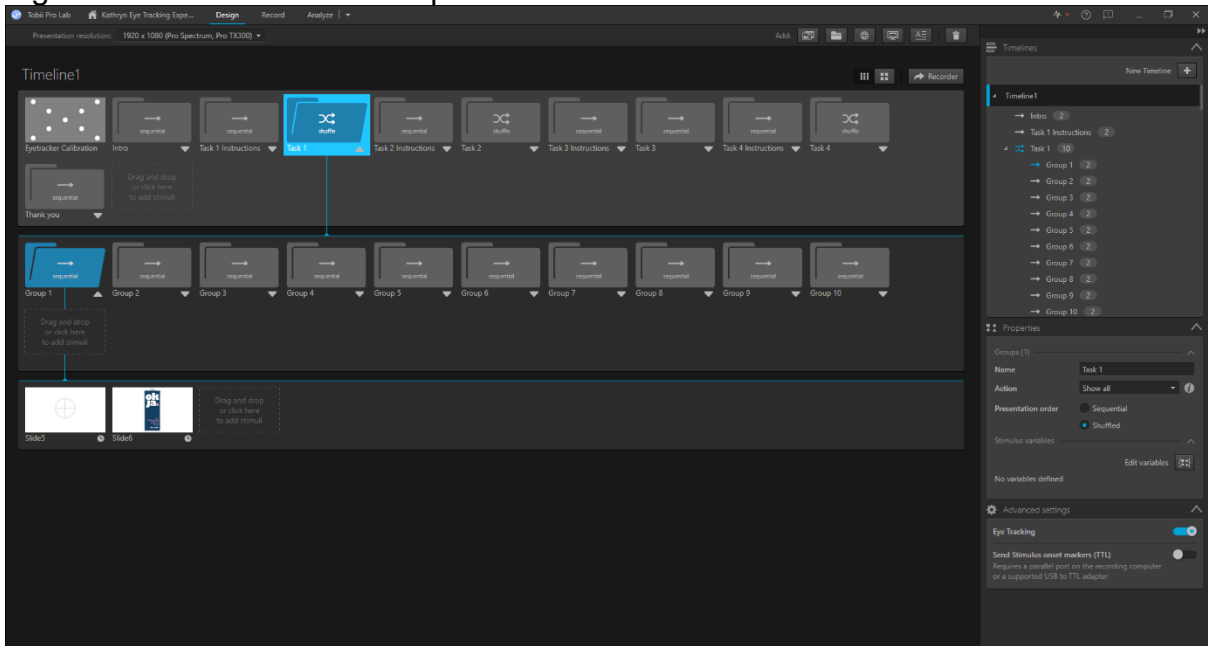


Figure 5.5: Task 1

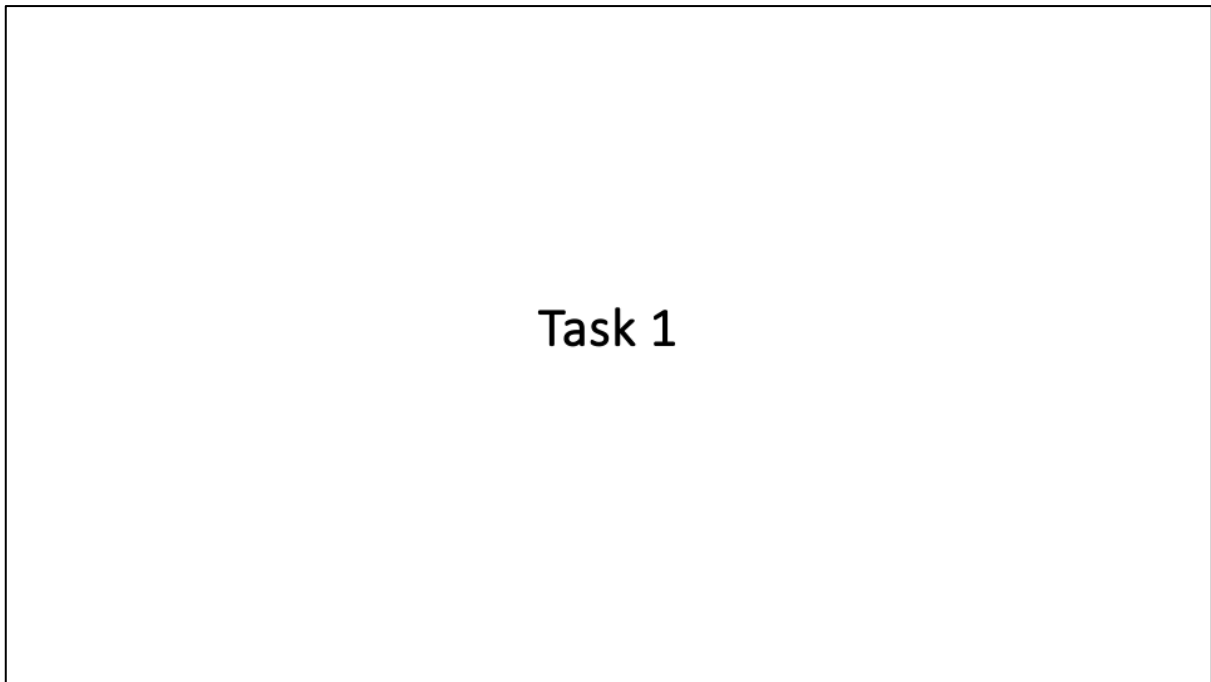


Figure 5.6: Task 1 Instructions

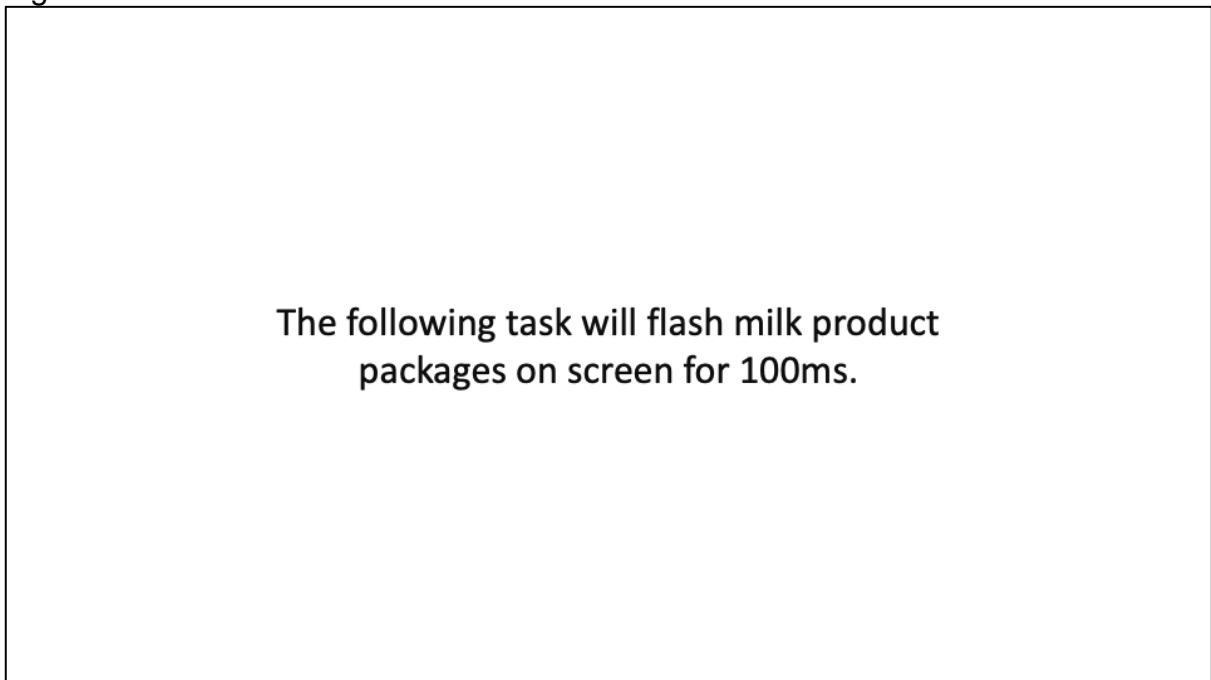


Figure 5.7: Task 2 Tobii Set Up

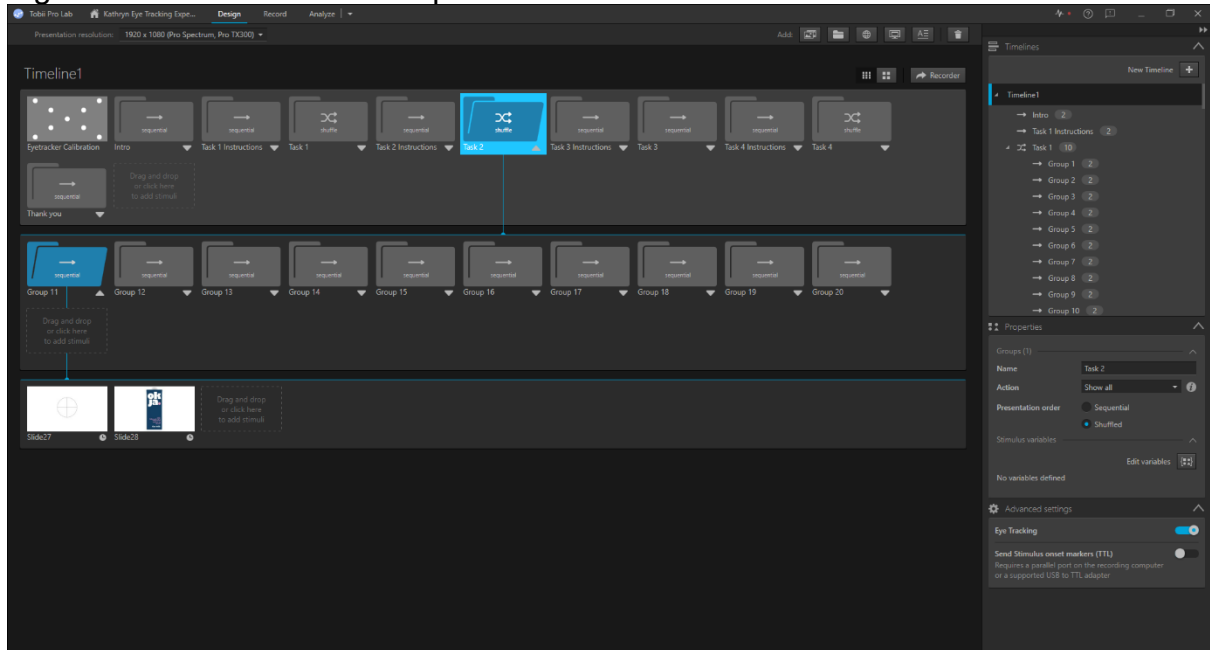


Figure 5.8: Task 2

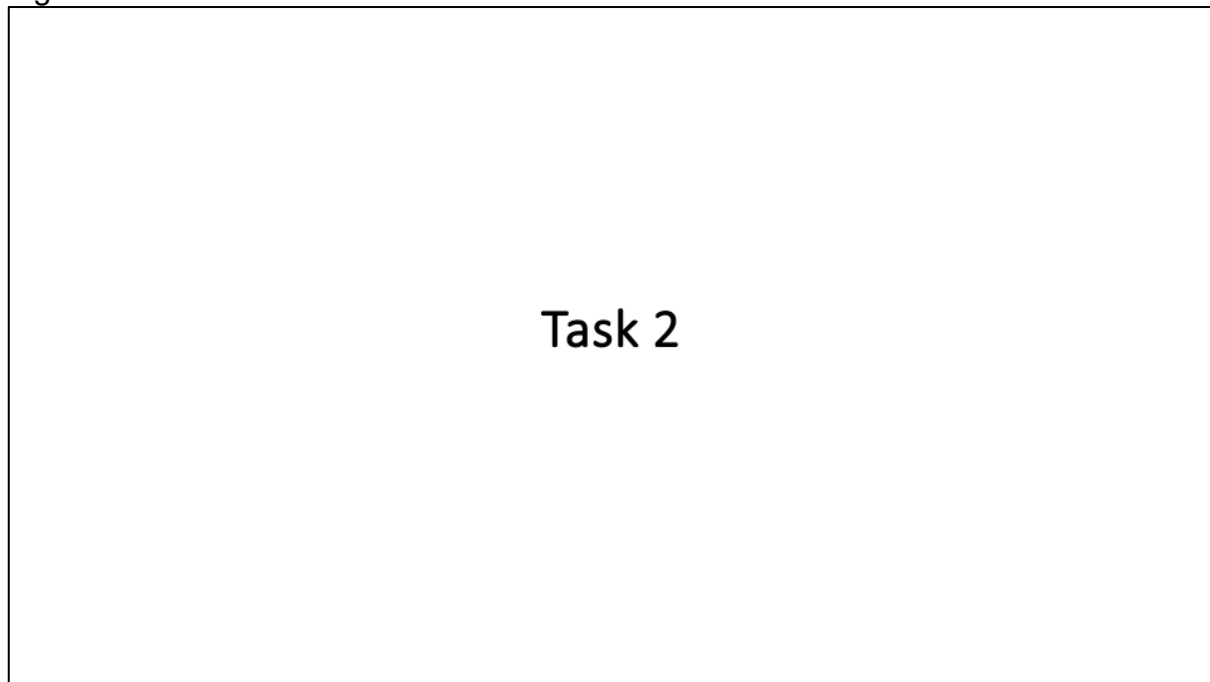


Figure 5.9: Task 2 Instructions

An image of a milk product package will appear on the screen for 2.5 seconds. Please focus on the package for the given time.

A total of **10 packages** will appear individually.

Figure 5.10: Task 3 Tobii Set Up

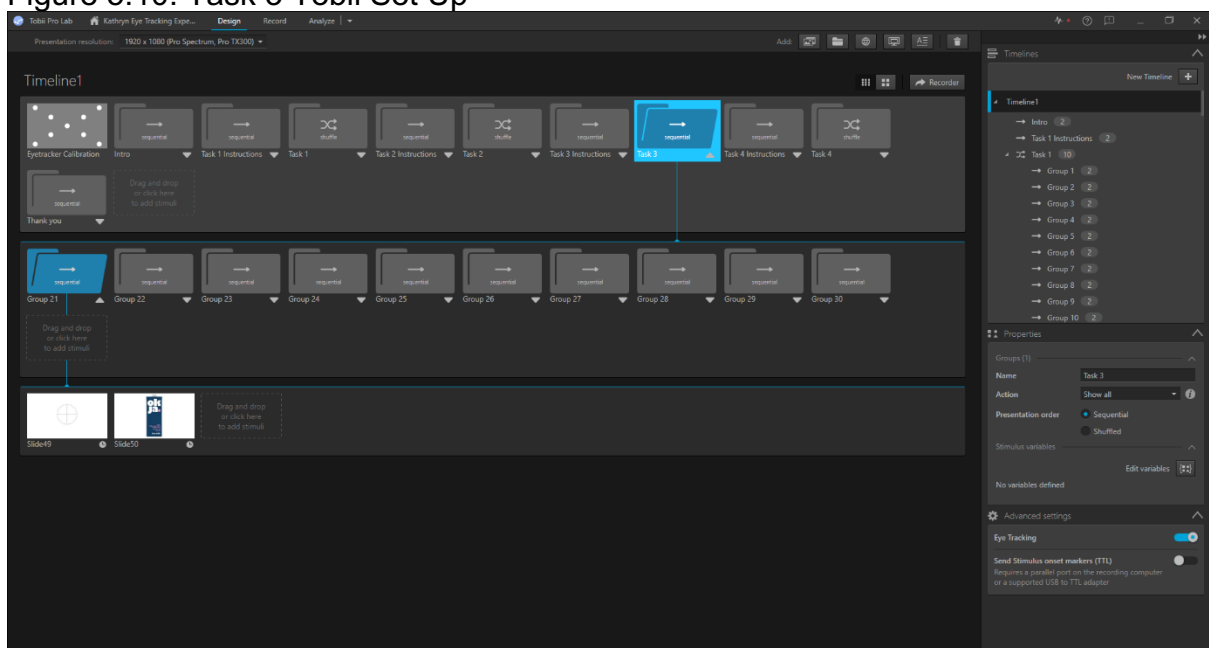


Figure 5.11: Task 3

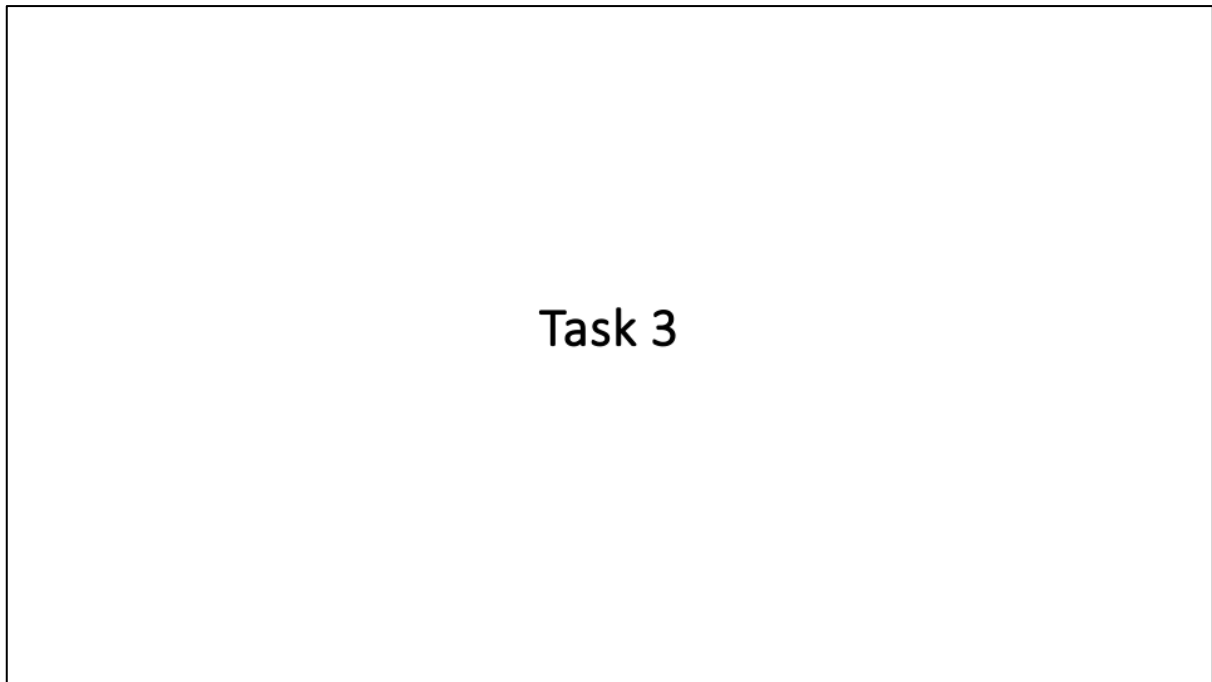


Figure 5.12: Task 3 Instructions



Figure 5.13: Task 4 Tobii Set Up

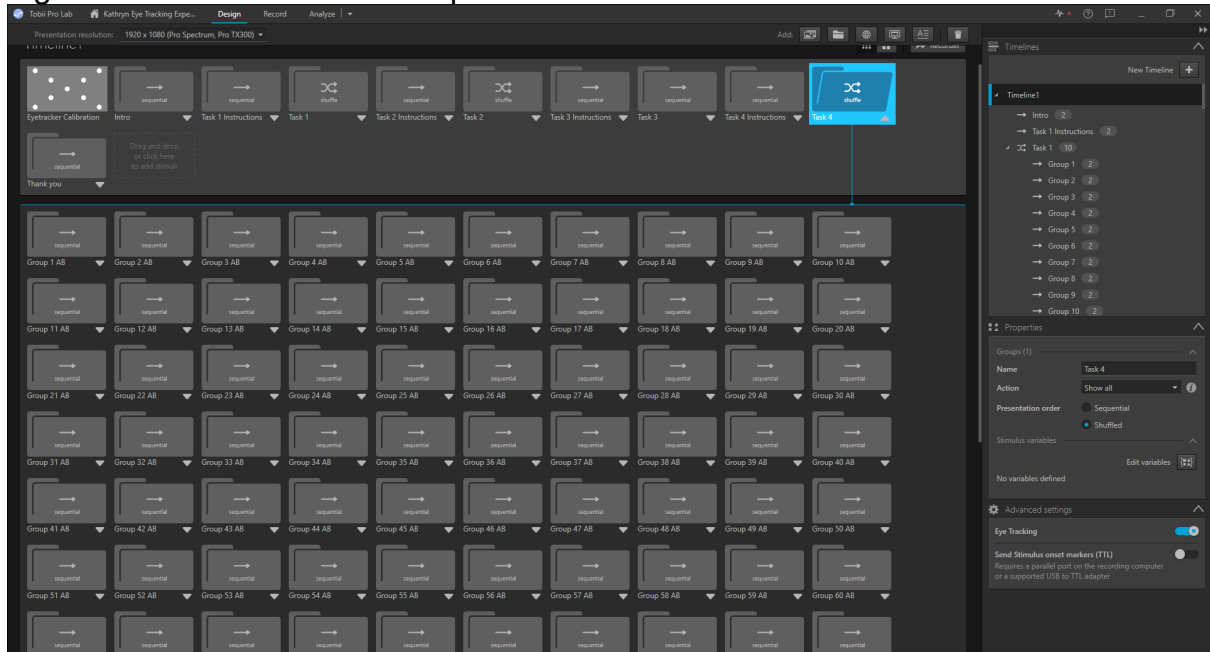


Figure 5.14: Task 4

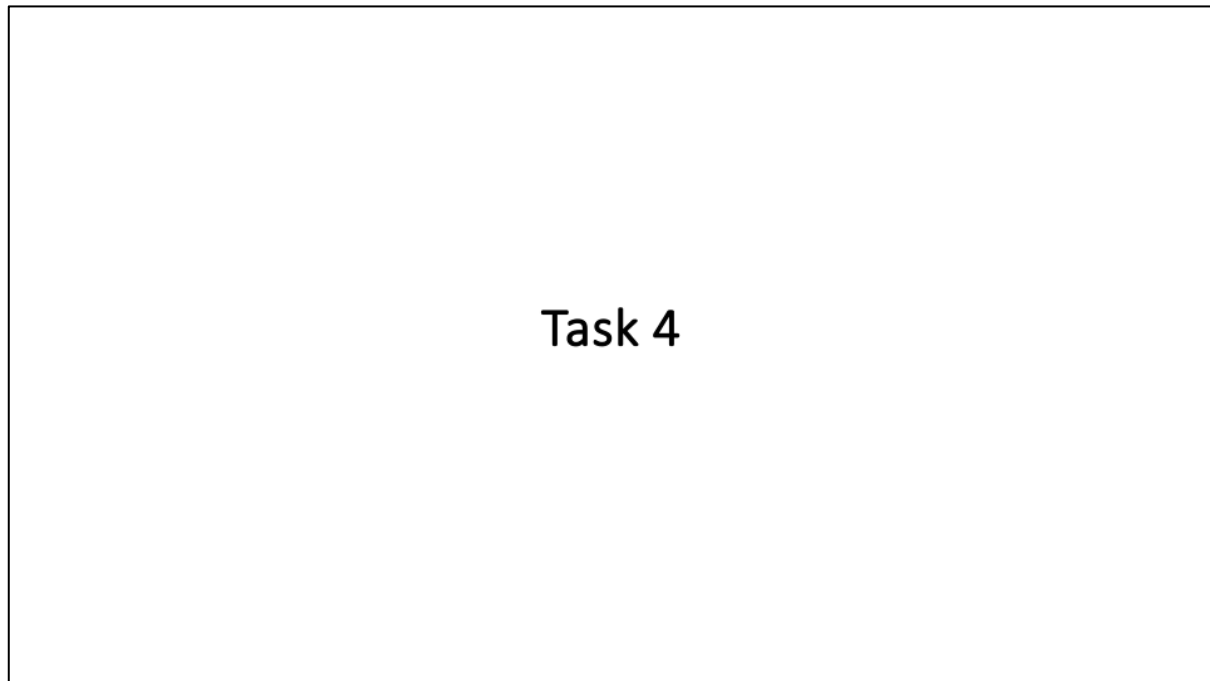


Figure 5.15: Task 4 Instructions

Please review the following slides and select which product package you **perceive** to be **more sustainable** *as fast as you can*.

Please use the left or right arrows on your keyboard to select the package on the left or right.



The arrows are depicted as such:



APPENDIX G: Tobii Pro Eye Tracker Setup

Figure 6.1: Tobii Pro Nano 60Hz



Figure 6.2: Placement of Tobii Eye tracker at base of screen



Figure 6.3: Eye tracker connected to device

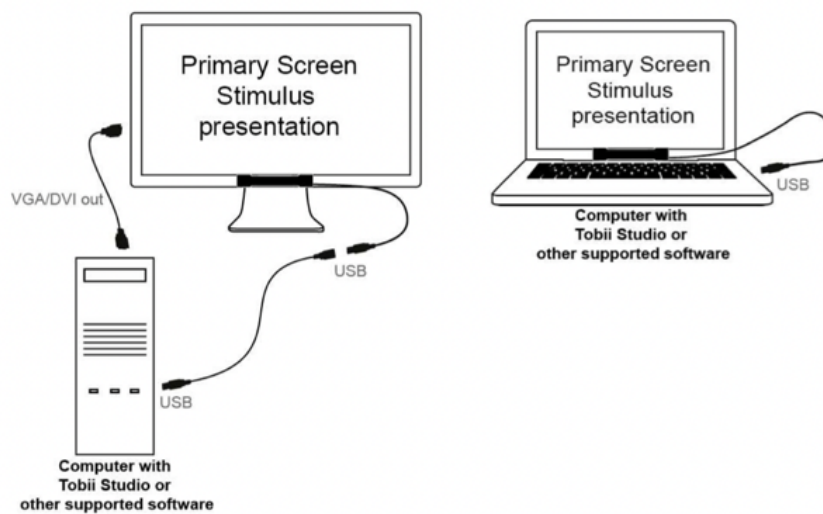


Figure 6.4: Participant distance from screen

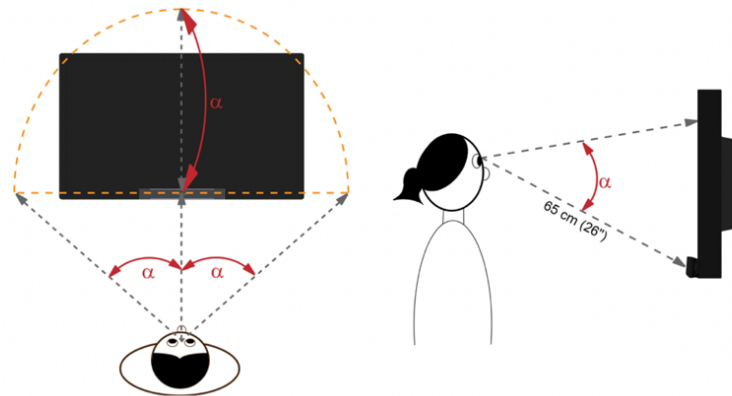


Figure 6.5: Eye Tracking Calibration

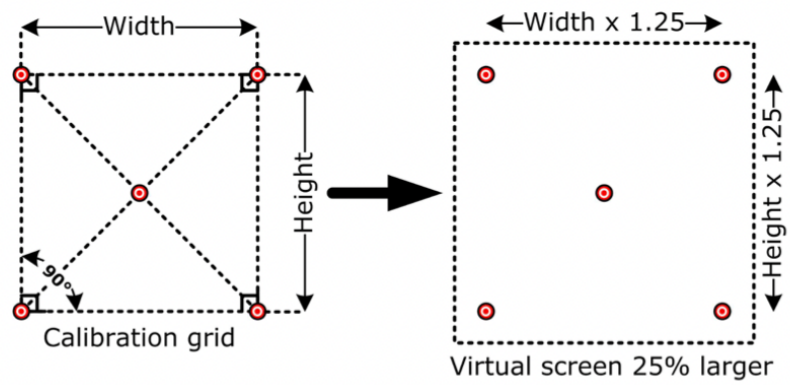


Figure 6.6: Calibration on Tobii Pro Labs

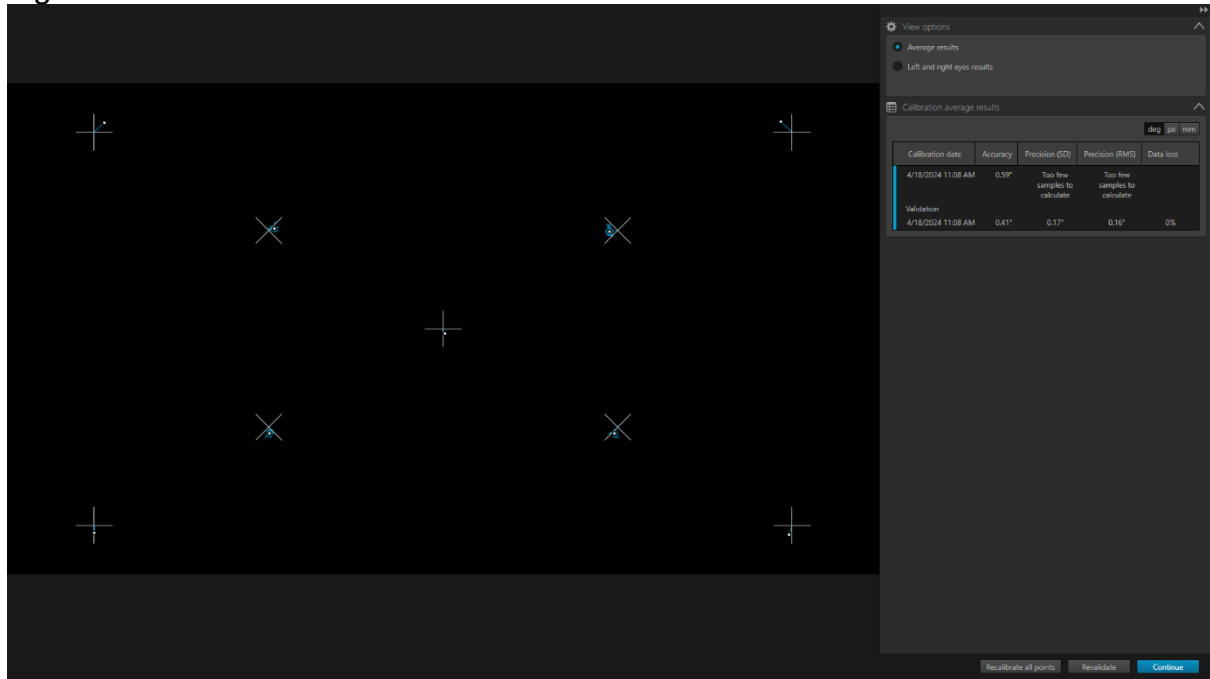
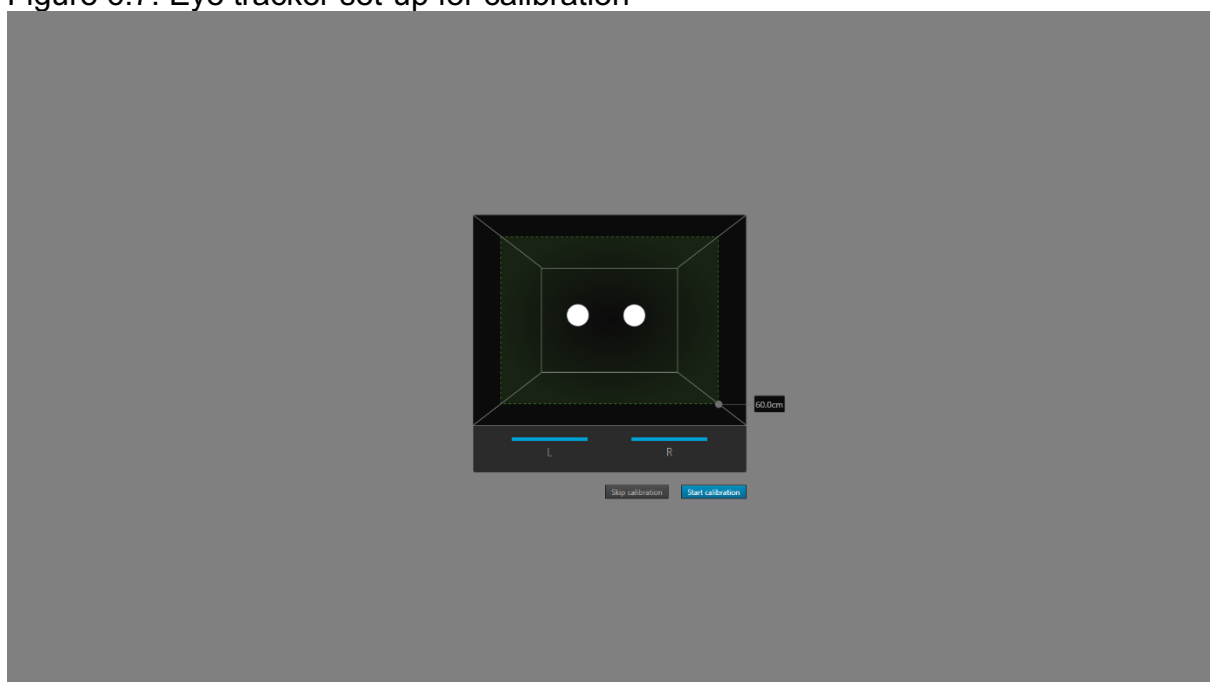


Figure 6.7: Eye tracker set-up for calibration



APPENDIX H: Interview



Kathryn Wahl WHLKAT003

Title: Unpacking the Effect of Sustainable Milk Packaging on Consumer Attention by Incorporating Eye Tracking Technology

Interview

Respondent Number

Participant XX

1. *Please sort the milk product packages into three groups of perceived sustainability: least, medium, most.*
2. *Which package do you perceive as most sustainable?*
 - C1
 - C2
 - C3
 - I1
 - I2
 - I3
 - T1
 - T2
 - T3
3. *Please substantiate reasons as to why you perceive this package as most sustainable?*
4. *Which package do you perceive as least sustainable?*
 - C1
 - C2
 - C3
 - I1
 - I2
 - I3
 - T1
 - T2
 - T3
5. *Please substantiate reason as to why you perceive this package as least sustainable?*

6. *Which elements/aspects of the package stand out the most to you as being perceived as sustainable and why?*
7. *Do you think being a plant-based/non-plant-based milk consumer impacts your decisions for perceived sustainability?*
8. *Please explain your answer.*

APPENDIX I: Consent Form



Dear student,

My name is Kathryn Wahl, and I am currently Masters of Business Science student specialising in Marketing. My study aims to investigate how various visual cues on product packaging influences consumers visual attention utilising eye tracking technology. This research study therefore aims to enhance our comprehension of the role of visual attention, thereby contributing to the refinement and robustness of neuromarketing investigations.

Participation in this study entails completing a brief screening questionnaire, followed by an eye tracking experiment and interview. In total, participation in both the experiment and interview is estimated to take around **15 minutes**. The study will take place at the University of Cape Town Upper Campus, in a quiet room in the Menzies building. The eye tracking experiment will utilise a Tobii screen-based eye tracking device which is non-invasive and records eye movements from a distance.

Participation is **voluntary** and responses will be kept **anonymous** and **confidential** to be used solely for the purpose of this investigation. Participants will not need to reveal personal details such as names, contact information or a physical address as this is not relevant to the study. Participants will be given a participant ID (e.g. Participant 1) to keep track of recordings. All the data captured will be kept on a password protected laptop and there will be no links back to the participants.

This research has been approved by the UCT Faculty of Commerce Ethics in Research committee. Approval to access students was also obtained from the Department of Student Affairs and the Faculty of Commerce.

To participate in the study individuals are required to:

- Be within the age range of **18 to 27 years**
- Have no serious eye conditions

If you're interested in participating, please enter your name, surname, and email address in the timeslot that best fits your schedule on the spreadsheet below.

<https://docs.google.com/spreadsheets/d/1nRT8PPzEV4IzICOVsAs4bgdncusO4MOpL5LY3xrBohs/edit?usp=sharing>.

Should you have any questions regarding the study, please do not hesitate to contact:

Kathryn Wahl: WHLKAT003@myuct.ac.za

Supervisors:

Dr Pragasen Pillay: p.pillay@uct.ac.za

Mr Ashraf Vahed: ashraf.vahed@neuralsense.com

Your participation will be greatly appreciated.

Kind regards
Kathryn Wahl

APPENDIX J: AOI's on product Packages

Figure 7.1: Original Oat Milk (O)

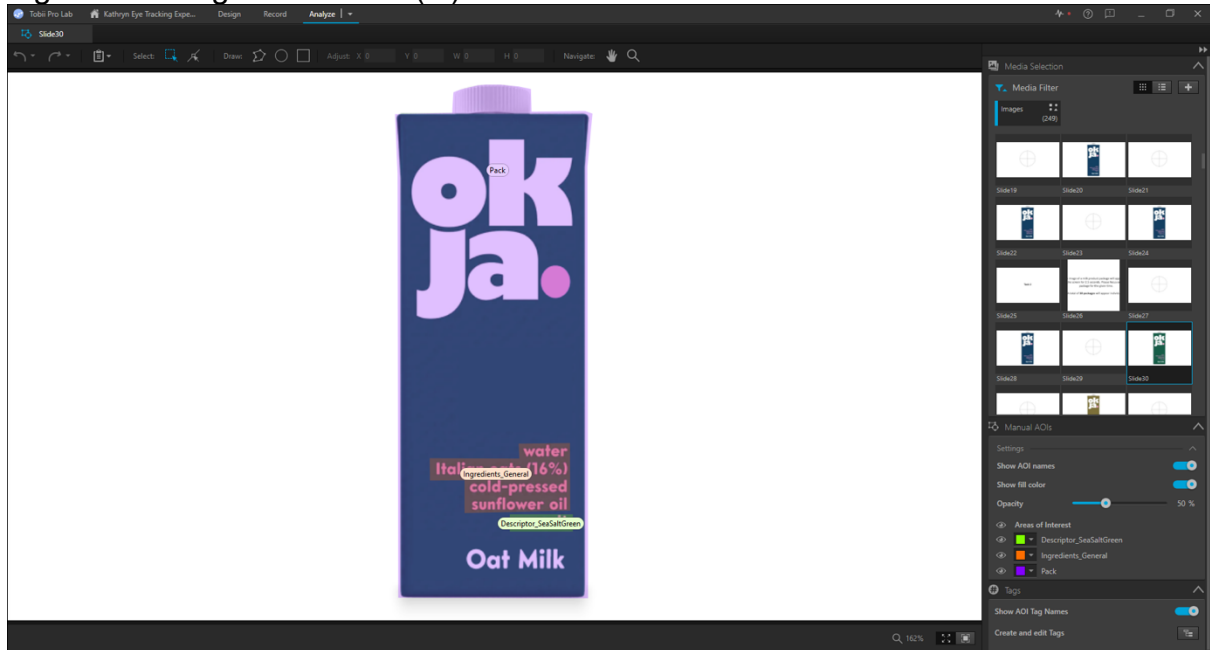


Figure 7.2: Colour C1 (Green)

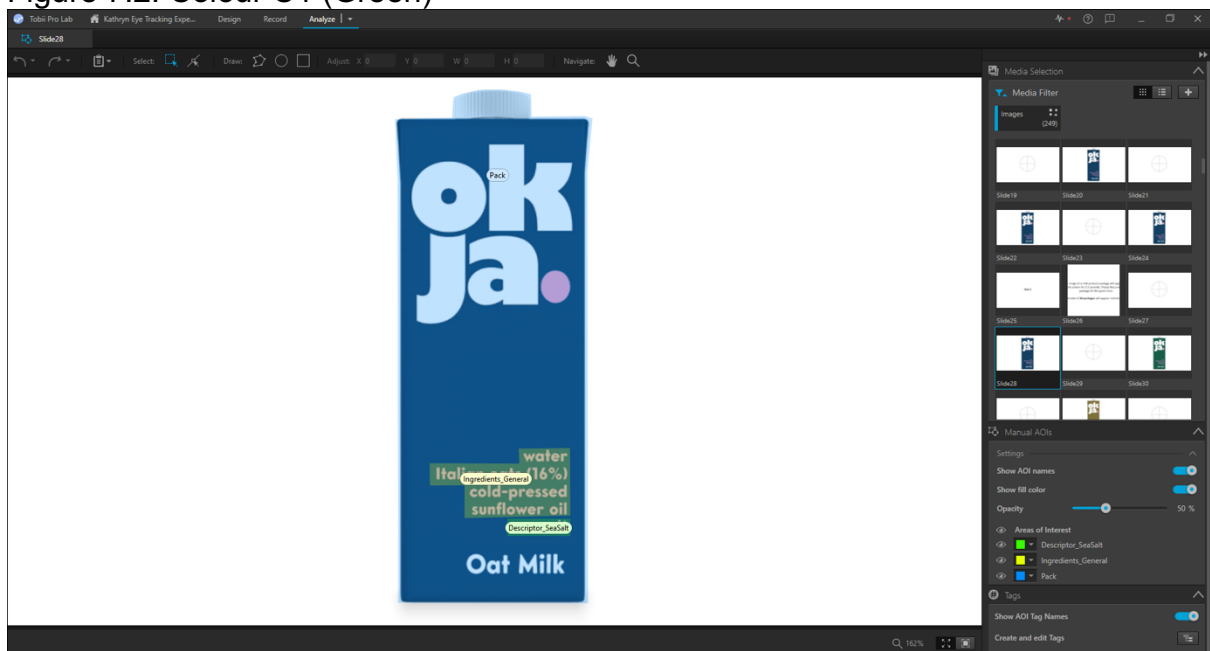


Figure 7.3: Colour C2 (Beige)

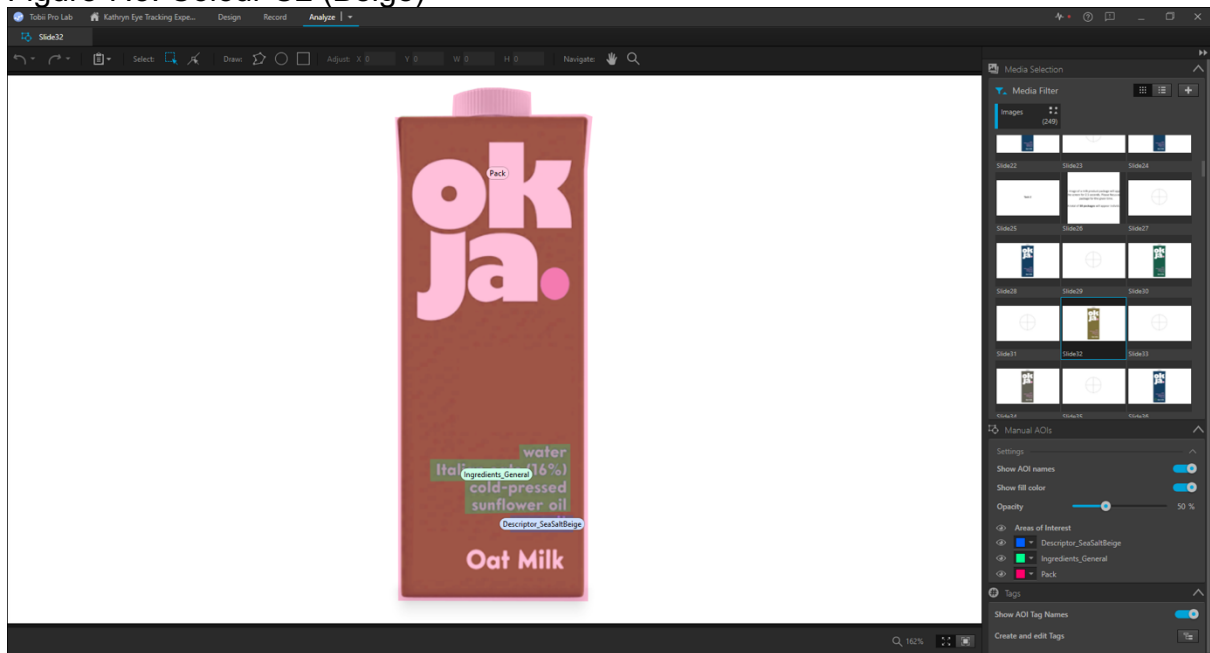


Figure 7.4: Colour C3 (Brown)

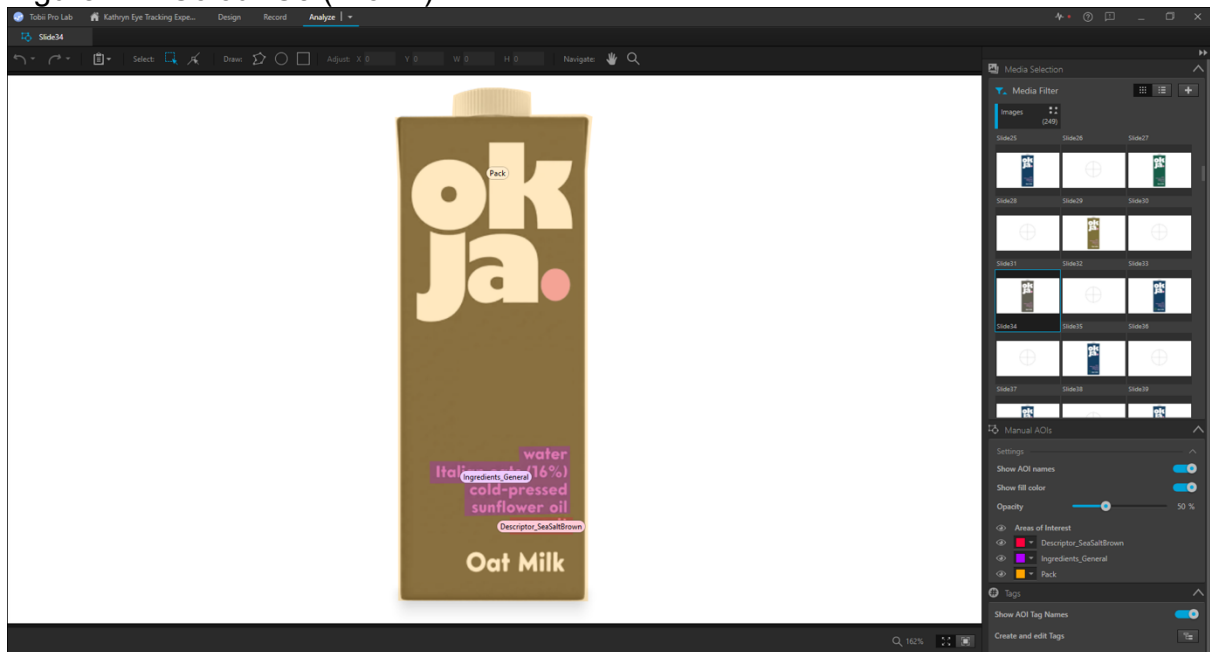


Figure 7.5: Icon I1 (Recycle)



Figure 7.6: Icon I2 (Vegan)

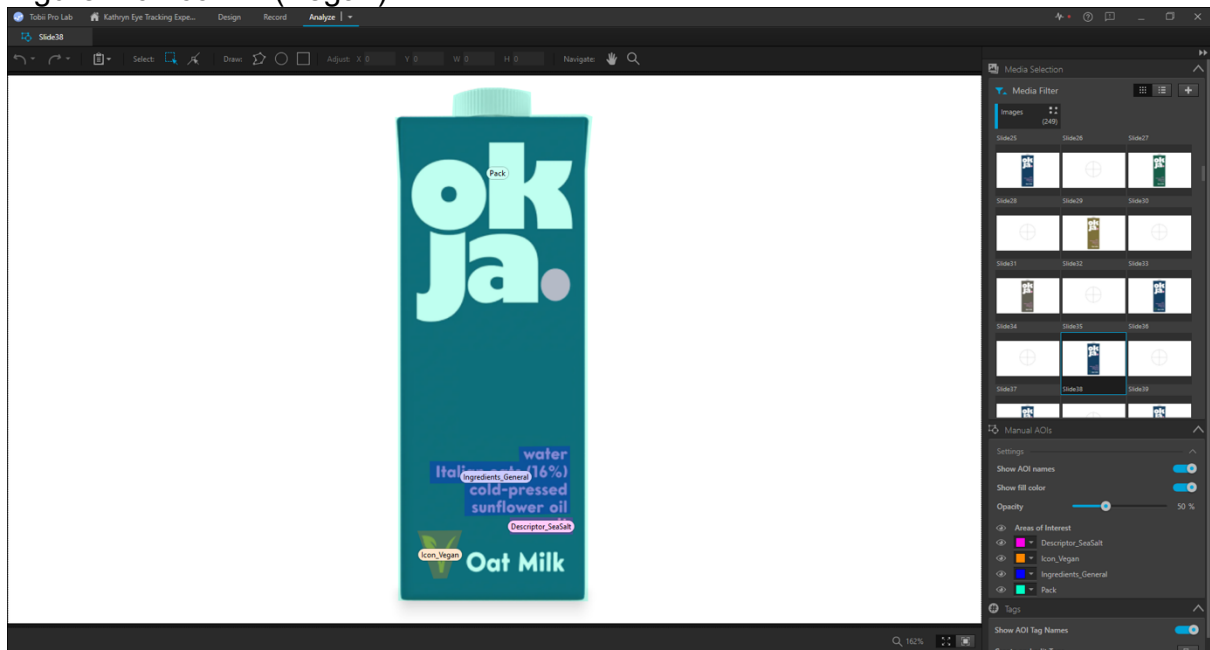


Figure 7.7: Icon I3 (FSC)



Figure 7.8: Text T1 (Vegan)

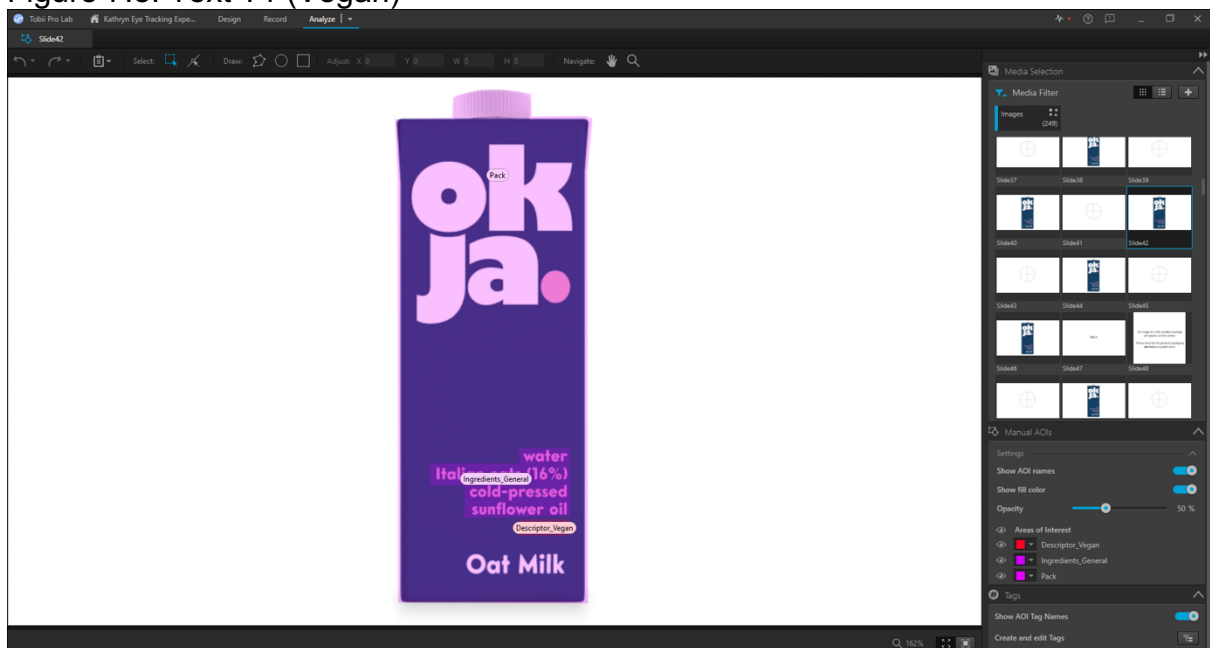


Figure 7.9: Text T2 (Plant-based)



Figure 7.10: Text T3 (Dairy-free)



APPENDIX K: Descriptive Statistics

Table 9: Different coloured packs, Icons and Textual Elements for Time to First Fixation (TFFF) and Total Fixation Duration (TFD)

	Mean (TFFF)	Std. Deviation (TFFF)	Mean (TFD)	Std. Deviation (TFD)
Blue Pack	0,02	0,073	2,08	0,40
Green Pack	0,01	0,053	2,13	0,35
Beige Pack	0,02	0,099	2,15	0,35
Brown Pack	0,01	0,042	2,17	0,30
Recycle Icon	0,25	0,574	0,08	0,212
Vegan Icon	0,25	0,525	0,11	0,242
FSC Icon	0,51	0,708	0,25	0,369
Vegan Text	0,06	0,274	0,01	0,049
Plant-based Text	0,35	0,720	0,09	0,204
Dairy-free Text	0,33	0,638	0,12	0,248

Figure 8.1: Distribution of Age Ranges

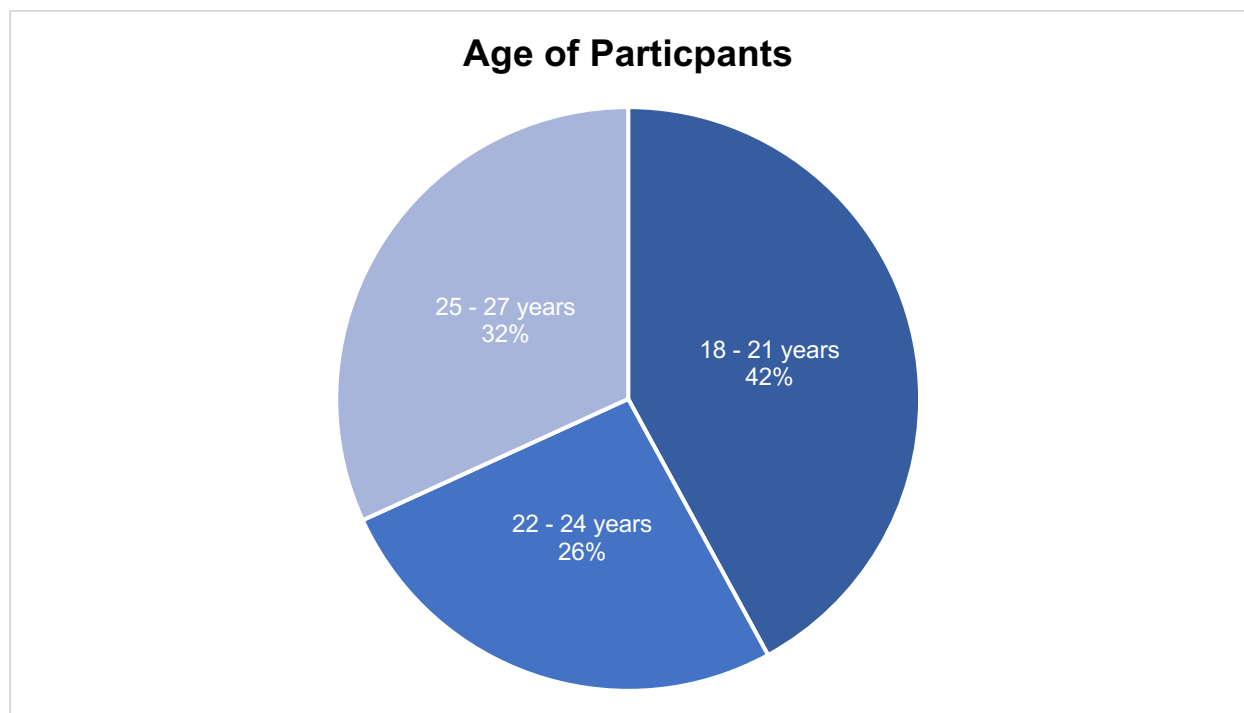
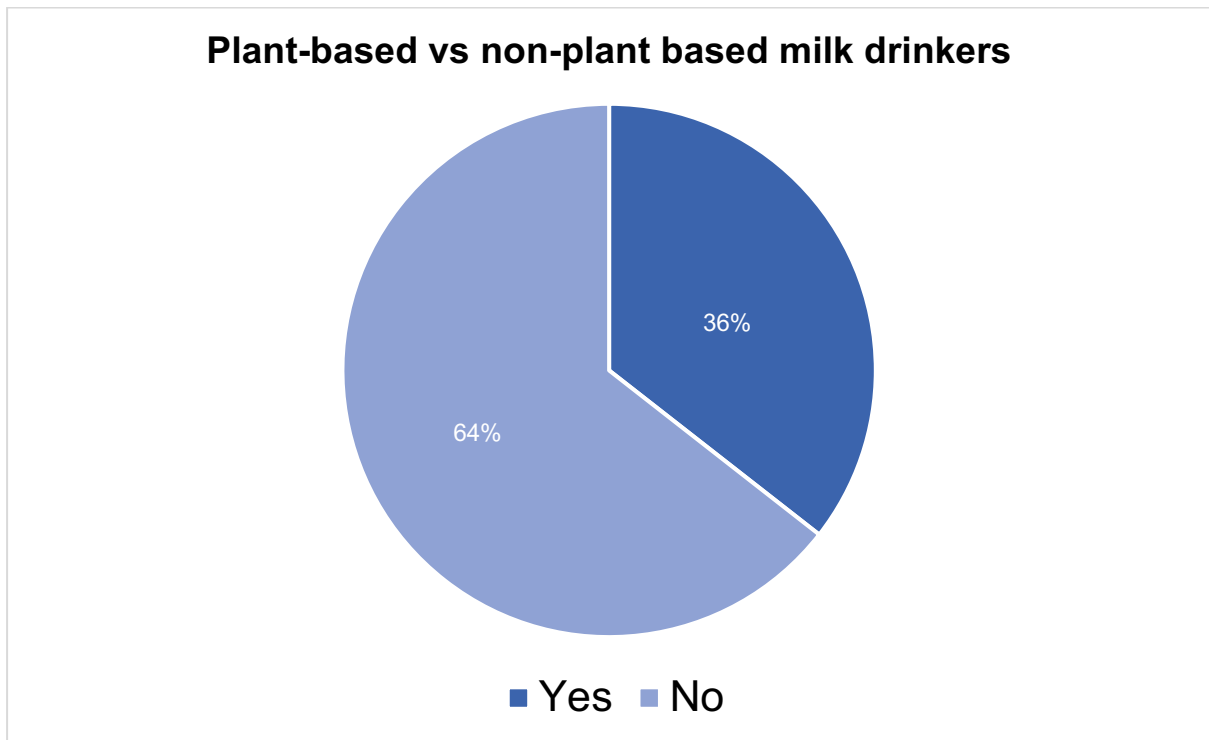


Figure 8.2: Plant-based milk vs non-plant-based milk drinkers



APPENDIX L: Quantitative Statistics

Table 10: Crosstabulation (Chi-Square test)

			Perceived Sustainability										P Value	
			Beige	Blue	Brown	Green	Dairy-free T	FSC Icon	Plant-based	Recycle Icon	Vegan Icon	Vegan Text		Total
CONTAINS ICON	No	Count	567	459	434	718	641	0	786	0	0	759	4364	0,000
		% within CONTAINS ICON	13%	10,5%	9,9%	16,5%	14,7%	0%	18%	0%	0%	17,4%	100%	
	Yes	Count	0	0	0	0	0	1157	0	1315	1189	0	3661	
		% within CONTAINS ICON	0%	0%	0%	0%	0%	31,6%	0%	35,9%	32,5%	0%	100%	
Total	Count	567	459	434	718	641	1157	786	1315	1189	759	8025		
	% within CONTAINS ICON	7,1%	5,7%	5,4%	8,9%	8%	14,4%	9,8%	16,4%	14,8%	9,5%	100%		

Table 11: Crosstabulation (Chi-Square test)

			Perceived Sustainability										P Value	
			Beige	Blue	Brown	Dairy-free Text	FSC Icon	Green	Plant-based Text	Recycle Icon	Vegan Icon	Vegan Text		Total
CONTAINS TEXT	No Text	Count	567	459	434	0	1157	718	0	1315	1189	0	5839	0,000
		% within CONTAINS TEXT	9,7%	7,9%	7,4%	0%	19,8%	12,3%	0%	22,5%	20,4%	0%	100%	
	Text	Count	0	0	0	641	0	0	786	0	0	759	2186	
		% within CONTAINS TEXT	0%	0%	0%	29,3%	0%	0%	36%	0%	0%	34,7%	100%	
Total	Count	567	459	434	641	1157	718	786	1315	1189	759	8025		
	% within CONTAINS TEXT	7,1%	5,7%	5,4%	8%	14,4%	8,9%	9,8%	16,4%	14,8%	9,5%	100%		

Table 12: Model Fitting Information

Model Fitting Information				
Model	Model Fitting Criteria	Likelihood Ratio Tests		
	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	247,901			
Final	243,110	4,792	10	0,905

Table 13: Goodness-of-Fit

Goodness-of-Fit			
	Chi-Square	df	Sig.
Pearson	326,392	315	0,317
Deviance	228,423	315	1,000

Table 14: Pseudo R-Square

Pseudo R-Square	
Cox and Snell	0,052
Nagelkerke	0,053
McFadden	0,015

Table 15: Likelihood Ratio Tests

Likelihood Ratio Tests				
Effect	Model Fitting Criteria	Likelihood Ratio Tests		
	-2 Log Likelihood of Reduced Model	Chi-Square	df	Sig.
Intercept	243,599	0,490	5	0,992
TTFF	244,575	1,465	5	0,917
TFD	246,999	3,889	5	0,565

The chi-square statistic is the difference in -2 log-likelihoods between the final model and a reduced model. The reduced model is formed by omitting an effect from the final model. The null hypothesis is that all parameters of that effect are 0.

Table 16: Crosstabulation (Chi-Square test)

			Perceived Sustainability												
			Blue	Brown	Beige	Green	Dairy-free Text	FSC Icon	Plant-based Text	Recycle Icon	Vegan Icon	Vegan Text	Total	P Value	
Green Presence	No	Count	459	434	567	0	641	1157	786	1315	1189	759	7307	0,000	
		% within Green Presence	6,3%	5,9%	7,8%	0%	8,8%	15,8%	10,8%	18%	16,3%	10,4%	100%		
	Yes	Count	0	0	0	718	0	0	0	0	0	0	0		718
		% within Green Presence	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%		100%
Total		Count	459	434	567	718	641	1157	786	1315	1189	759	8025		
		% within Green Presence	5,7%	5,4%	7,1%	8,9%	8%	14,4%	9,8%	16,4%	14,8%	9,5%	100%		
Beige Presence	No	Count	459	434	0	718	641	1157	786	1315	1189	759	7458		0,000
		% within Beige Presence	6,2%	5,8%	0,0%	9,6%	8,6%	15,5%	10,5%	17,6%	15,9%	10,2%	100%		
	Yes	Count	0	0	567	0	0	0	0	0	0	0	0	567	
		% within Beige Presence	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%	0%	100%	
Total		Count	459	434	567	718	641	1157	786	1315	1189	759	8025		
		% within Beige Presence	5,7%	5,4%	7,1%	8,9%	8,0%	14,4%	9,8%	16,4%	14,8%	9,5%	100%		
Brown Presence	No	Count	459	0	567	718	641	1157	786	1315	1189	759	7591	0,000	
		% within Brown Presence	6%	0%	7,5%	9,5%	8,4%	15,2%	10,4%	17,3%	15,7%	10%	100%		
	Yes	Count	0	434	0	0	0	0	0	0	0	0	0		434
		% within Brown Presence	0%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%		100%
Total		Count	459	434	567	718	641	1157	786	1315	1189	759	8025		
		% within Brown Presence	5,7%	5,4%	7,1%	8,9%	8,0%	14,4%	9,8%	16,4%	14,8%	9,5%	100%		
Blue Presence	No	Count	0	434	567	718	641	1157	786	1315	1189	759	7566		0,000
		% within Blue Presence	0%	5,7%	7,5%	9,5%	8,5%	15,3%	10,4%	17,4%	15,7%	10%	100%		
	Yes	Count	459	0	0	0	0	0	0	0	0	0	0	459	

Table 17: Crosstabulation (Chi-Square test)

				Perceived Sustainability												
				Blue	Brown	Beige	Green	Dairy-free Text	FSC Icon	Plant-based Text	Recycle Icon	Vegan Icon	Vegan Text	Total	P Value	
Recycle Icon Presence	No	Count		459	434	567	718	641	1157	786	0	1189	759	6710	0,000	
		% within Recycle Icon Presence		6,8%	6,5%	8,5%	10,7%	9,6%	17,2%	11,7%	0,0%	17,7%	11,3%	100%		
	Yes	Count		0	0	0	0	0	0	0	1315	0	0	1315		
		% within Recycle Icon Presence		0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	100%		
Total			Count	459	434	567	718	641	1157	786	1315	1189	759	8025		
			% within Recycle Icon Presence	5,7%	5,4%	7,1%	8,9%	8,0%	14,4%	9,8%	16,4%	14,8%	9,5%	100%		
Vegan Icon Presence	No	Count		459	434	567	718	641	1157	786	1315	0	759	6836		0,000
		% within Vegan Icon Presence		6,7%	6,3%	8,3%	10,5%	9,4%	16,9%	11,5%	19,2%	0%	11,1%	100%		
	Yes	Count		0	0	0	0	0	0	0	0	1189	0	1189		
		% within Vegan Icon Presence		0%	0%	0%	0%	0%	0%	0%	0%	100%	0%	100%		
Total			Count	459	434	567	718	641	1157	786	1315	1189	759	8025		
			% within Vegan Icon Presence	5,7%	5,4%	7,1%	8,9%	8,0%	14,4%	9,8%	16,4%	14,8%	9,5%	100%		
FSC Icon Presence	No	Count		459	434	567	718	641	0	786	1315	1189	759	6868	0,000	
		% within FSC Icon Presence		6,7%	6,3%	8,3%	10,5%	9,3%	0%	11,4%	19,1%	17,3%	11,1%	100%		
	Yes	Count		0	0	0	0	0	1157	0	0	0	0	1157		
		% within FSC Icon Presence		0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	100%		
Total			Count	459	434	567	718	641	1157	786	1315	1189	759	8025		
			% within FSC Icon Presence	5,7%	5,4%	7,1%	8,9%	8%	14,4%	9,8%	16,4%	14,8%	9,5%	100%		

Table 18: Crosstabulation (Chi-Square test)

			Perceived Sustainability										P Value		
			Blue	Brown	Beige	Green	Dairy-free Text	FSC Icon	Plant-based Text	Recycle Icon	Vegan Icon	Vegan Text		Total	
Vegan Text Presence	No	Count	459	434	567	718	641	1157	786	1315	1189	0	7266	0,000	
		% within Vegan Text Presence	6,3%	6%	7,8%	9,9%	8,8%	15,9%	10,8%	18,1%	16,4%	0%	100%		
	Yes	Count	0	0	0	0	0	0	0	0	0	759	759		
		% within Vegan Text Presence	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	100%		
Total		Count	459	434	567	718	641	1157	786	1315	1189	759	8025		
		% within Vegan Text Presence	5,7%	5,4%	7,1%	8,9%	8%	14,4%	9,8%	16,4%	14,8%	9,5%	100%		
Plant-base Text Presence	No	Count	459	434	567	718	641	1157	0	1315	1189	759	7239		0,000
		% within Plant-based Text Presence	6,3%	6%	7,8%	9,9%	8,9%	16%	0%	18,2%	16,4%	10,5%	100%		
	Yes	Count	0	0	0	0	0	0	786	0	0	0	786		
		% within Plant-based Text Presence	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	100%		
Total		Count	459	434	567	718	641	1157	786	1315	1189	759	8025		
		% within Plant-based Text Presence	5,7%	5,4%	7,1%	8,9%	8%	14,4%	9,8%	16,4%	14,8%	9,5%	100%		
Dairy-free Text Presence	No	Count	459	434	567	718	0	1157	786	1315	1189	759	7384	0,000	
		% within Dairy-free Text Presence	6,2%	5,9%	7,7%	9,7%	0%	15,7%	10,6%	17,8%	16,1%	10,3%	100%		

	Yes	Count	0	0	0	0	641	0	0	0	0	0	641	
		% within Dairy-free Text Presence	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	100%	
Total		Count	459	434	567	718	641	1157	786	1315	1189	759	8025	
		% within Dairy-free Text Presence	5,7%	5,4%	7,1%	8,9%	8%	14,4%	9,8%	16,4%	14,8%	9,5%	100%	

Table 19: Mann-Whitney Test

		N	Mean Rank	Mann-Whitney U	Z	P Value
Blue	PLANT-BASED MILK CONSUMER	34	44,59	921,000	-0,258	0,796
	NON-PLANT-BASED MILK CONSUMER	56	46,05			
	Total	90				
Green	PLANT-BASED MILK CONSUMER	34	38,49	713,500	-1,987	0,047
	NON-PLANT-BASED MILK CONSUMER	56	49,76			
	Total	90				
Beige	PLANT-BASED MILK CONSUMER	34	48,76	841,000	-0,926	0,355
	NON-PLANT-BASED MILK CONSUMER	56	43,52			
	Total	90				
Brown	PLANT-BASED MILK CONSUMER	34	42,31	843,500	-0,904	0,366
	NON-PLANT-BASED MILK CONSUMER	56	47,44			
	Total	90				

Table 20: Mann-Whitney Test

		N	Mean Rank	Sum of Ranks	Mann-Whitney U	Z	P Value
Recycle Icon	PLANT-BASED MILK CONSUMER	34	47,74	1623,00	876,000	-0,926	0,354
	NON-PLANT-BASED MILK CONSUMER	56	44,14	2472,00			
	Total	90					
Vegan Icon	PLANT-BASED MILK CONSUMER	34	44,43	1510,50	915,500	-0,417	0,676
	NON-PLANT-BASED MILK CONSUMER	56	46,15	2584,50			
	Total	90					
FSC Icon	PLANT-BASED MILK CONSUMER	34	47,06	1600,00	899,000	-0,488	0,626
	NON-PLANT-BASED MILK CONSUMER	56	44,55	2495,00			
	Total	90					
Vegan Descriptor	PLANT-BASED MILK CONSUMER	34	44,78	1522,50	927,500	-0,571	0,568
	NON-PLANT-BASED MILK CONSUMER	56	45,94	2572,50			
	Total	90					
Plant Based Descriptor	PLANT-BASED MILK CONSUMER	34	45,38	1543,00	948,000	-0,042	0,966
	NON-PLANT-BASED MILK CONSUMER	56	45,57	2552,00			
	Total	90					
Dairy Free Descriptor	PLANT-BASED MILK CONSUMER	34	43,15	1467,00	872,000	-0,843	0,399
	NON-PLANT-BASED MILK CONSUMER	56	46,93	2628,00			
	Total	90					

APPENDIX M: Qualitative Statistics

	Original - O	Colour - C1 (Green)	Colour - C2 (Beige)	Colour - C3 (Brown)	Icons - I1 (Recycle)	Icons - I2 (Vegan)	Icons - I3 (FSC)	Text - T1 (Vegan)	Text - T2 (Plant-Based)	Text - T3 (Dairy-Free)
1	Boring	Environmental	Boring	Dull	Recycling	Vegan	Oat milk	Vegan	Plant-based	Cold-pressed
2	Clean	Fresh	Ground	Overcast	Fresh	Ocean	Sky	Clean	Simple	Vegan
3	Blue	Green	Beige	Grey	Recycling	Vegan-friendly	FSC	Plain	Plain	Plain
4	Blue	Greenery	Gross	Alright	Pretty	Pretty	Alright	Plain	Plain	Plain
5	Aesthetic	Interesting	Grotesque	Warm	Aesthetic	Professional	Informative	Not environmentally conscious	Okay	Informative
6	Generic	Vibrant	Dull	Calm	Vibrant	Vegan friendly	Green logo	Normal	Larger	Text
7	Fun	Green	Bland	Berry	Blue	Yum	Vibrant	Dairy	Tasty	Tasty
8	Default	Green	Terrible colour	Terrible colour	Sustainable sign	Plant sign	Different sign	Indifferent	Same	Carbon copy
9	Bland	Calming	Neutral	Boring	Bland	Bland	Simple	Balanced	Simple	Boring
10	Blue	Earthy	Dull	Monotone	Recycling	Plant	Simple	Common	Classic	Classic
11	Blue	Foreign	Drab	Boring	Bright	Environmentally friendly	Environmentally friendly	Eye catching	Eye catching	Eye catching
12	Blue	Green	Brown	Grey	Blue	Pink	Green	Blank	Clean	Clean
13	Blue	Green	Big	Dull	Bright	Bright	Vibrant	Dull	Dull	Dull
14	Blue	Green	Salt	Oats	Green	Big	Pink	Water	Different	Dairy-free
15	Water	Grass	Wheat	Dull	Bright	Vegan	Green	Milk	Cold	Cow
16	Pink	Plant	Chocolate	Chocolate milk	Recyclable	Vegan	Regular	Water	Ocean	Ocean
17	Blue	Oat milk	Greenish grey	Grey	Okja	Okja	Okja	Okja	Okja	Purple
18	Blue	Green	Beige	Grey	Recycle	Vegan	Blue	Blue	Blue	Blue
19	Plain	Captivating	Aesthetic	Aesthetic	Eco-friendly	Vegan	Approved	Simple	Simple	Simple

20	Oat milk	Italian oats	Okja	Greyish	Light pink	Plant based	FSC	Cold pressed	Small	Dairy free
21	Blue	Pink	Brown	Lid	Container	Plants	Sea	Oats	Bright	16
22	Aesthetic	Natural	Monotonous	Regular	Attractive	Aesthetically pleasing	Conservative	Dull	Standard	Blue
23	Blue	Ocean Sea	Organic	Invisible	Blue	Vegan	Blue	Blue	Blue	Minimalist
24	Okja	Green	Water	16%	Oat milk	Blue	Italian	Oil	Sunflower	Oats
25	Dull	Earthy	Natural	Artificial	Bland	Empty	Bland	Simple	Boring	Boring
26	Bright	Bright	Longer to read	Long	Bright	Bold	Captivating	Bright	Creative	Creative
27	Simple	Calming	Natural	Modern	Recyclable	Vegan	Aesthetic	Balanced	Simple	Simple
28	Plain	Green	Earthy	Neutral	Bright	Bright	Plain	Simple	Simple	Simple
29	Blue	Pink	White	Grey	Recycling	Plant based	Blue	Oat	White	Milk
30	Blue	Milk	Pink	Plant based	Milk	Sustainable	Healthy	Blue	Imported	Blue
31	Pink	Contrast	Plain	Dull	Environmentally friendly	Vegan	Environmentally friendly	Plain	Plain	Plain
32	Blue	Green	Brown	Pink	Dark blue	Plant based	FSC	Vegan	Plant based	Dairy free
33	Blue	Green	Beige	Grey	Recycle	Plant	Blue	Pink	Bold	Health
34	Familiar	Green	Gross	Dull	Recycling	Vegan	Approved	Plain	Ordinary	Ordinary
35	Blue	Contrasting	Warm	Muted	Pops out	Typical	Typical	Typical	Typical	Typical
36	Pink	16%	Ja	Cold pressed	Recyclable	Sunflower	FSC	Pink	Pink	Ja
37	Blue	Green	Tan	Grey	Recycle	Blue	Blue	Blue	Blue	Blue
38	Interesting	Bland	Bland	Better	Recyclable	Plant based	Eco friendly	Bland	Bland	Bigger
39	Blue	Green	Brown	Grey	Recycle	Healthy	Colourful	Boring	Boring	Wordy
40	1L milk	Oat milk	Oat milk	Italian oats	Blue	Sunflower oil	Blue	White	Long	Dairy free
41	Blue	Conflicting	Unclear	Earthy	Original	Plants	Approved	Simple	Simple	Cow

42	Blue	Leaf	Orange	Red	Blue	Leaf	FSC	Oat milk	Water	Okja
43	Pink	Colourful	Texture	Colourful	Recyclable	Vegan	FSC	Uninformative	Uninformative	Informative
44	Clean	Green	Brown	Bland	Recyclable	Vegan	Modern	Clean	Clean	Dairy free
45	Plain	Alternative	Aesthetic	Boring	Recyclable	Plant based	Eco friendly	Plain	Boring	Plain
46	Big	Captivating	Chocolate	Simplistic	Interesting	Interesting	Contrasting	Simplistic	Easy	Cow
47	Pink	Bold	Brown	Pink	Recyclable	Plant	Tree	Blue	Blue	Italian
48	Informative	Recyclable	Recyclable	Low quality	Bright	Bright	Informative	Oat milk	Oat milk	Oat milk
49	Blue	Eco	Minimalist	Boring	Recycle	Vegan	Legit	Plain	Plain	Interesting
50	Blue	Green	Beige	Grey	Recycling	V	FSC	Pink	Simple	Dairy free
51	Sunny	Natural	Eco friendly	Clean	Favourite	Milky	Clean	Plain	Plain	Okja
52	Normal	Healthy	Chocolate	Old	Recyclable	Vegan	Trees	Original	Same	Same
53	Blue	Weird	Boring	Bland	Interesting	Different	Interesting	Bland	Bland	Boring
54	Clean	Funky	Bland	Murky	Clear	Vegan	Clear	Basic	Basic	Plain
55	Cold	Sustainable	Expired	Bland	Recyclable	Vegan	Ethical	Vegan	Fresh	Plant based
56	Blue	Passive	Brown	Creative	Purple	Plant	Safe	Plain	Basic	Indifferent
57	Blue	Pink	Ok	Grey	Pink	Pink	Blue	Simple	Bold	Blue
58	Blue	Bold	Bland	Grey	Bright	Big	Same	Boring	Plain	Missing
59	Neat	Sustainable	Bland	Boring	Recyclable	Vegan	Healthy	Plain	Clear	Dairy free
60	Plain	Plain	Recyclable	Plain	Recyclable	Eco-friendly	Eco-friendly	Plain	Plain	Bland
61	Clean	-	Fitting	Dull	Impactful	Impactful	Dimmer	Dimmer	Plain	Plain
62	Blue	Oat	Milk	Milk	Blue	Blue	OkJa	Oat	Milk	Oat
63	Blue	Green	Healthy	Bland	Recyclable	Blue	Blue	Blue	Blue	Blue

64	Bland	Ocean	Cardboard	Cow	Clean	Healthy	Clean	Fine	Nut	Odd
65	Vegan	Green	Different	Darker	Recyclable	Plants-sourced	Similar	-	Plant-based	Bland
66	Blue	Oat	Rectangular	Pink	Healthy	Blue	Milk	Blue	Plastic	Dairy-free
67	Simple	Not eye catching	Ugly	Okay	Thoughtful	Thoughtful	Fake	Simple	Simple	Longer
68	Blue	Minimal	Minimal	Bland	Eye catching	Eye catching	Eye catching	Same	Same	Same
69	Ordinary	Different	Unattractive	Bland	Cool	Interesting	Unique	Ordinary	Ordinary	Ordinary
70	Plain	Green	Dull	Blank	Recyclable	Healthy	Blank	Blank	Dull	Dull
71	Appealing	Weird	Natural	Dull	Green	Vegan	Sustainable	Bland	Bland	Bland
72	Neat	Green	Bland	Grey	Recycle	Plant friendly	Tree	Neat	Blue	Blue
73	Blue	Green	Brown	Pale	Normal	Vegan	FSC	Bland	Blue	Blue
74	Plain	Green	Brown	Grey	Recycle	Vegan	Certified	Plain	Plain	Dairy free
75	Blue	Green	Pink	Bold	Pink	Leaf	Tree	Simple	Plain	Plain
76	Dot	Green	Dirt	Lavender	Ocean	Duplicate	Redundancy	Empty	Dry	Chunky
77	Bold	Nature	Mustard	Sad	Positive	Natural	Legitimate	Bold	Clean	Attractive
78	Blue	Artificial	Earthy	Natural	Recyclable	Organic	Impressive	Simple	Simple	Simple
79	Plain	Sea	Spice	Sad	Intriguing	Plant	Tree	Simple	Boring	Ball
80	Milk	Leaf	Hay	Pencil	Pink	Sea	Box	Ok	Plastic	Food
81	Cool	Awkward	Chilled	Indistinguishable	Cool	Cool	Weird	Odd	Odd	Odd
82	Blue	Forest	Cardboard	Lavender	Water	Vegan	Sustainable	Simple	Simple	Milk
83	Blue	Forestry	Unappealing	Boring	Sustainable	Vegan	Environmental awareness	Simple	Blue	Blue
84	Blue	Water	Oats	Grey	Blue	Plants	Oats	Vegan	Plant-based	Dairy-free
85	Blue	Green	Chocolate	Pudding	Original	Blue	Blue	Regular	Camps Bay	Oat

86	Blue	Green	Coffee	Boring	Vibrant	Vegan	Blue	Neutral	Neutral	Muted
87	Blue	Green	Beige	Grey	Recycle	Plant	Tree	Normal	Normal	Normal
88	Minimalist	Environmental	Cardboard	Subtle	Informative	Ocean	Green icon	Pink	Minimalist	Minimalist
89	Plain	Vibrant	Grass	Plain	Eye catching	Sustainable	Sustainable	Empty	Minimalist	Minimalist
90	Blue	Green	Mustard	Grey	Recycle	Plant based	Tree	Vegan	Plant based	Dairy free

INTERVIEW TRANSCRIPT

Which package do you perceive as the **most sustainable** and why?

C1 - Green

- Because Green is associated with nature. I think it needs to be a brighter green.
- Ya, I think it was just always green associated with eco-friendly. For me vegan doesn't necessarily mean more sustainable. Whereas green is more a universal recycle element.
- The colour green

C2 - Beige

- Because it looks like it made from recyclable materials from brown colour.
- I associate the colour of the packaging with sustainability from what it's made of.
- I think because it just remind me of earth. It's made from earth materials and no added colourants.
- Doesn't look like it's got colour any i.e. it looks like natural materials
- I kind of look at it and the material looks recyclable.
- The packaging is giving like it's been made from recycled products.
- It looks like cardboard to me. So, it seems more sustainable. When products have colour, it is usually treated and harder to recycle.

C3 - Brown

- I think the brown packaging feels earthy and good for the earth.
- The less colouring on the packaging is easier to recycle
- Because I think it's the colour. It looks recycled.

I1 – Recycle Icon

- Because I assume this is made out of cardboard.
- Because a lot of packaging is important for me so the fact that it's recyclable helps.
- It has recycling logo on it and because it seems all natural.
- Because of the reuse reduce recycle logo. The icon at the bottom.
- They use natural products and it's recyclable so it's environmentally friendly.
- I think because the recycle symbol most people know what it means.
- I feel like it's the symbol I most recognise.
- Because it's recyclable.
- The recycling logo
- Cause it's oat milk so that's already vegan and it shows you can recycle the packaging
- I feel like they always use it for being recycled
- Because of the packaging and the logo makes me feel like it will be biodegradable and recyclable.
- Because if a package says it's recyclable you believe that it is whilst just saying it's plant based doesn't mean it's sustainable.
- The green and recycle logo
- Merely based on the fact it means you can recycle it or it's made from recyclable materials.
- Because it's recyclable
- I think the reduce reuse recycle I have seen my whole life so it's what associate with me sustainable and environmentally friendly

- Umm I think looking at the signs, the plant means plant based I think it's sustainable it could refer to ingredients. But recycle one is more to do with packaging.
- Because it has the recyclable symbol on it.
- The thing that stood out most was the recycling logo that was mostly my decision in a lot of the questions.
- It has the recycling logo and I assume that's for sustainability
- Because of the little recycle sign. Even though they're all vegan this one goes further to say it is vegan.
- It's recyclable
- The recycle sign
- Recyclable material
- Because it has recyclable logo so it will incentivise you to recycle.
- Because it has the recyclable the sign so it's not just the ingredients but the packaging too.
- I think it just speaks to the recyclable nature of the product.
- This little recycle logo which I know sounds silly.
- Well if you don't recycle there are landfills, oceans, trash, co2 in the air and pollution in general. Plant based is already sustainable. So, the package should also be.
- It's honestly because of the recycle sign.
- Because I don't really know what FSC means but it seems a bit general. I think recyclable is a bit self-explanatory.
- Because you can recycle it.
- It has the recycle icon because you know the package is recyclable.

I2 – Vegan Icon

- The vegan icon is a big decider out of the three icons. The blue colour hints at clean and sustainable image.
- The symbol at the bottom of the package.
- The V stands for vegan so it's shorthand and it pops out as V for vegan.
- The V symbol I associate that with sustainability and plant-based things
- I'm not sure but the plant thingie.
- I think I looked at these markings, but the V is simplistic but gives off sustainability more. Recycle is kinda overused.
- Because vegan is associated with the rest of the icons and healthy and sustainable lifestyles.
- Because it's showing plants and vegan, so you know it's plant based and most likely recycled material as well.
- Just feels like the green leaf
- Because I don't know what the logo mean, and I can see it's paper, so I know it's recyclable.
- The vegan icon I believe that more than recyclable.
- The symbols, it's informative, the vegan symbol in particular
- Sea salt and the plant V symbol
- For me it's the leaf that signifies sustainability
- Whenever I see a green V I think the environmental aspect has been considered. Being vegan, it is a symbol I look for.
- I like how informative it is. It attracts the eye better. I think the contrast also make info easier to read.
- The vegan icon stood out the most to me as being plant based and thus sustainable.

I3 – FSC Icon

- It has a tree - maybe it's a company or something.
- Because it's about limiting forestation whereas recycling depends on the end user wanting to recycle.
- Because of the of the forest protection symbol
- I know FSC has to do with something with sustainability of the environment
- Because it has the logo on it that looks fancy.
- Because I see some company's logo here and they're doing a sustainable job whereas the other ones I don't know where they come from.
- FSC sounds very serious
- It just looks like someone gives this the green light
- The eco-friendly sign on it gives me a better signature as someone who's been an environmental student before than the packaging itself.
- Whenever I see the logo it's always in a whole foods or health foods place
- Looks more official
- The symbol has more credibility and looks approved
- The icon indicates plant materials and it's sustainable in terms of the environment
- The FSC looks more official than the other logos.
- Because FSC seems approved, and it might be a logo for something. There's a tick and a tree.
- Because it is actually certified by an organisation compared to greenwashing through recycling for instance. I work a lot with green products, so a lot of people worry about packaging. I don't care as much about it being vegan more about packaging.
- Because it has the tree
- The symbols gets me and anything that represents a lead or recycle. I tend to think it's accredited in some way and is sustainable.
- The green things at the bottom. So FSC seems impressive to me.
- Maybe cause it's got the organisation. It looks official. But I would rather look at the actual material.
- The FSC, the rector logo doesn't always mean it's recyclable. It seems more accredited. The colours aren't that deceiving to me.
- Because of the FSC mark
- It's just the inclusion of an actual body that approves it makes the difference.

T2 – Plant-based

- As I look at it my eyes are drawn to plant-based
- The simplicity of the package. Dairy free is not really needed because it's oat milk. Vegan sometimes has negative connotations. Maybe because it's been in the market so long that I prefer it.

T3 – Dairy-free

- Because it's dairy free so it doesn't have any animal products

Which package do you perceive as the **least sustainable** and why?

C1 - Green

- Just because of the colour of the packaging. There's something about colour and recyclability.
- The packaging isn't seeming sustainable
- Of the colours it's almost the least natural colour it's not as neutral
- Too colourful
- There's nothing that it indicates it's sustainable, but the green colour isn't great. The more earthy neutral colours are better.
- Because the colour is artificial. It's cool but doesn't look sustainable.
- There's no instructions on whether you can recycle. It's very pigmented too.
- It's a very bright colour so it doesn't seem sustainable. More natural colours.

C2 - Beige

- To me the yellow colour is quite dirty.
- Colour wise it doesn't match with nature but green does
- It just looks kind of off, looks a little bit like there isn't effort put into the package. The colour is throwing me off.
- I think just like the colour. It doesn't scream sustainability to me.
- The colour scheme doesn't work with the pink and yellowish
- The colour is not great
- That colour isn't good, and it lacks the information.
- I don't like the colour.
- Just the colour is different, and it doesn't have any symbols to suggest sustainability
- Um because it has nothing to indicate that it's sustainable. Even the words just say sea salt.
- The brown colour itself, not sustainable
- I just don't like the colour. The other ones kind of tell you they are vegan, and plant based. So, all three colours don't give off that.
- It just looks very dull, and it doesn't seem like much thought or effort went into it. Green or blue has an environmental connotation.
- Colour is off putting and doesn't convey anything about sustainable. I wouldn't have noticed they were trying to anything.
- I don't know the colours like honestly doesn't look natural or popping. Doesn't have any signs.

C3 - Brown

- It's just not packaged prettily.
- Because the colours are on same level. Green reminds me of plants and beige reminds me of cardboard so brown is odd one out.
- Simply because it doesn't have anything that says sustainable on it.
- Just the colour of the packaging. And it doesn't mention anything about plant based or dairy free.
- I'm not sure but I think the brown feels unsustainable compared to the rest.
- The packaging, maybe it's the colour.

- I don't know it gives off that it used a lot of chemicals to put it together.
- Cause it doesn't say anything about recycling the packaging.
- I feel like that colour isn't very sustainable.
- I don't know there's nothing specific just basing it off colour.
- The colour isn't very intriguing, ya I don't really find it that nice.
- Because blue is like ocean green is plants brown is earthy but grey lifeless.
- Just cause it doesn't say anything about sustainability, and it says sea salt. Dark colour reminds me of pollution or smog.
- With green we can sustain this more but brown not so much.
- Colour and no vegan or plant-based text
- Brown is not appealing for milk
- The colour brown is generally bland while green is more earthy.
- Because of the overall colour is kinda dull and brown. Normally green is associated with sustainability.
- It's not a natural brown earthy tone I guess. It's more digital.
- Brown is bland and doesn't seem sustainable compared to green. There isn't anything on it that makes me think it's sustainable.
- I don't like the colour. And it says sea salt.
- When I think about sustainability and colour and psychology. Something that is more green will make me think it's more sustainable.
- Just the colours in general because they don't have any sustainable cues like the logos or text.
- It is bland.

I1 – Recycle Icon

- Recycle signs are trying to reinforce it too much but I feel like it might not be.

I2 – Vegan Icon

- The logo on it is kind of greenwashing me, it is not as recognisable as the other 2 logos.

T1 – Vegan Text

- Vegan products are detrimental to insects.
- Because it is more effort to produce vegan products.
- I'm not vegan but I feel like it's not sustainable.
- Maybe there's a little more processing to create vegan products.
- Because it's a given that it's dairy free. But vegan doesn't necessarily mean it's sustainable
- The word vegan puts me off.
- You're more drawn to the other two.
- A lot of vegan products require special materials
- So, I think the colors give more sustainable. In general, the blue implies less sustainable. It's just because of recycle sign I feel like it's more sustainable. There are no words that make me think it's sustainable.
- Because it just says vegan but obviously it's vegan.
- Umm there's no mark on it and it's the original color. I think the colour looks more sustainable. Because it says vegan, plant- based and dairy free sounds more sustainable.
- Basically, because there are some negative connotations attached to it.

T2 – Plant-based

- Because there's no Green emblems on it and it doesn't due any sustainability.
- It's pretty dumb but if it's plant based it will use a lot of plants
- Basic and not informative, just tells you what's in it
- I think even though it says plant based in my mind they are burning plants to create the package.

T3 – Dairy Free

- Dairy-free doesn't describe sustainable to me.
- Because in my mind when I think of sustainable I think of nature and not really animals.
- I'd say because it's not being very specific.
- Because there's no like recycling symbol. It's the most unnatural colour.
- Due to the fact that compared to the other packages. Dairy free is difficult to access when making a product.
- I feel like plant based and vegan has more positive links to sustainability. Dairy free still might have harsh things.
- Because it the colour is not as natural, and it doesn't have the logos or say vegan or plant based. Dairy free and oat milk are kind of similar.
- The other textual elements sound better for the earth because it's dairy free doesn't mean it's good.
- Because it's dairy free, plant seems more like something that is sustainable.
- I feel like it costs more to make dairy free.
- Because the others have plant in them. I do understand that it is oat milk, but this is dairy free,
- Just saying it's dairy free isn't saying it's plant based it could just be lactose free
- I think the amount of wording and info is a bit too much. It detracts from the fact that it's using recycled material.
- The connotation of dairy free sounds more like a health thing.
- Because it's like dairy free, is it vegan is it plant based? Just cause it's dairy free doesn't mean it's sustainable.
- I think plant based makes it look more organic like it uses more natural material and vegan implies care for nature.
- The others are vegan, and plant based, dairy free isn't as sustainable in my mind,
- Well, I think compared to the others like it doesn't have the logos or the colours. I think it's a good colour but compared to other seems least sustainable. Also dairy free is less sustainable than other text.
- No organic feel me no symbols. No vegan or plant based, no indication towards that
- The bright colours makes it look not sustainable compared to the earthy tones who's colours make it seem more sustainable
- There's no information but this one doesn't have plant based or vegan.
- Because it has no icon and it's only dairy free so they could be using chemicals.
- Usually that implies a chemical has been substituted to make it a certain way.
- I think this colouring is the least sustainable. It doesn't say the packaging reusable. There's nothing pointing that it's sustainable.
- Oat milk is already dairy free, and it doesn't necessarily mean it's sustainable.

Which elements/aspects of the package stand out the most to you as being perceived as sustainable and why?

- The colour of the packaging, the green and the recycling logo. That tells me it's sustainable and recyclable.
- The icons for sure, they hint more at sustainability. Recycle logo and vegan icon are sustainable and are universally known.
- Green icons is eye catching against the dark blue.
- Colour contrast, the brown is really plain. The icons at the bottom also help with my perception.
- The neutral colours because it shows the company did not spend that much ink to manufacture the package which equates to me as being environmentally sustainable.
- Colour (green and beige) and then the ones with icons.
- Natural colours and the green emblems.
- Definitely the icons on the bottom left. I associate sustainability with green. It all alludes to sustainable things.
- Colour because greener colours correlate with greener initiatives. Brown colours correlate sustainable. And icons too.
- Just the indication on the bottom stand out and draw your attention.
- Definitely the systole because they are quick hand for sustainability. The print doesn't pop out and grab attention.
- Icons because it shows it is sustainable.
- The little images. They stand out because they're a different colour.
- Logos, the colours feel more natural.
- The green and the V and the FSC. I associate that with plant based and sustainability.
- The icons because I know it means vegan and recyclable.
- The logos, we've been around them for some time and they represent good for nature
- I think the icons because they seem separate from the branding so they're an extra stamp of sustainability
- The green icons and also at the bottom the textual claims.
- It's the logos they have elements inside them which tell us,
- Yes the logos. Most products have these logos, so I'm used to seeing it.
- The symbols but also the colour.
- Having the green symbol. But not recycle logo. And then when it is in warm earthy colours.
- The elements that I see for icons they seem more sustainable than the others,
- The symbols and the natural colours that was like pure sustainability
- The green symbols. I think they're good symbols for packages. Also, the word plant based is more natural elements.
- The logos because they display the fact that sustainability has been considered into the packaging and the vocabulary used,
- The natural colours
- Definitely the green icons. It just seems more official but not necessarily the plant based one. But the recycle one and forest one.
- The green colour and the logo seems good. Seems more simplified and quality.
- The logos and the colour. The words don't do much for me,
- Icons I guess because I'm drawn more to them.
- The green package, or the earthy colours stick out. The stamp is more indicative.
- Umm despite these little markings being distracting, I find that it is a good indicator.

- I think mainly the icons.
- The green colour definitely most people associate green with sustainability and these signs also stood out to me the most.
- The recycle one is striking and the icons in general
- The environmentally friendly logos and the colours the environmental colours rather than the plain normal packaging
- I think definitely the plant based or vegan I think that is more effective than dairy free I still think about lactose. Plant based and vegan is more healthy for environment and also green package and the recycle logo stands out the most. The FSC one also stands out as being official as well as vegan.
- The word plant based
- The three icons and the green pops out against a uniform background.
- The icons but recycle logo because I know it's recyclable.
- Definitely the informative stickers and the textual claims.
- The icons
- The logos because it's very much so showing an approved sustainable product
- The green because of the environment and the little symbols I think those are the most effective because the FSC symbol I recognise it but the other 2 are easier to recognise.
- The green logos but then also the plant based and dairy free text
- The more neutral colours reminds me of the environment.
- The recycle logo that always seemed more sustainable for me.
- Leaf or recycle logo. Or the whole packaging begins green, the colour two colours are meh.
- The colour was a big thing for me and the little logos even though I don't know exactly what they mean.
- These logos because they are a different colour, and it stands out and green colour gives idea of sustainability
- The green symbols because that's how I think of sustainability I think of green and those symbols.
- The green symbols really stick out to me because it makes me be, I've they're healthy and good for environment.
- I would say the images because they are immediately recognisable and give you an association. The last word in the descriptions stood out to me.
- The symbols, it's informative. Colours as well, I think brownish and green
- The colour of the whole thing. When there's not a lot of colour I feel like there's less stuff used,
- I think the signs they seem like more official. I think the colours are earthy.
- Colours like green and symbols have association
- Symbols due to association and has credibility
- The symbols and the symbols green colours. It looks nature friendly and can be recycled and the earthy tones looks nature friendly
- The recycle signs, people usually want to buy things that are good for the environment
- The signs because it shows up a lot in cartons
- The product itself, when people think of sustainable they look for sea salt. Packaging looks clean keeps milk fresh for longer
- The logos placed in green and the text (which are more consumer requirements than text). Blue goes well with the packaging while earthy colour are less attractive
- The little symbols and the textual elements.
- The logos because they are informative logos. You can perceive the logos from a distance, but the writing isn't up in your face. The fact that it's oat milk you know it's already plant based etc.

- It's probably the logos next to the name, and it's how I associate it with stuff I've seen.
- This recycling symbol because of recycling. I think the colour as well. And also, what it says.
- The stamps on the bottom of the packages so they're universal so you know what you're looking at.
- Ya so I think the brown and the green because of earthy tones. The ones that stood out most were earthy symbols.
- The green logos and then I think I focus myself on vegan and plant based.
- I'd say the plant based and the little green logos. When something is plant based it is more holistic. Recycling and FSC is also a very good thing for sustainability.
- The logos because of the colour and what they represent. The words also make it more explicit. Colours don't really convey sustainability to me.
- These little green things because we're taught about them.
- The colours
- I guess I'd say the icon.
- The FSC but then also the vegan word but having said that also the earthy tones.
- Ummm the little logos helped especially the fact they're green. The colour of the packages make me think they're recycle. I pay attention to ingredients.
- The labels and the green colour. Whenever I'd see the green logo I'd automatically go for it. Also text, I would read the last line.
- The colour of the beige seems so similar to a cardboard box. I think the green icons also. Just because it's there it stands out.
- The fact you can tell it's a cardboard box it doesn't look plastic. Something about the simplicity about explaining the ingredients. It feels more transparent.
- The signs, then the green colour and then the writing.
- The symbols that show sustainability.
- The green icons and the top colours. Especially the middle one the beige.
- The symbols because it captures your eye because it stands out from the base colour.
- Besides the icons maybe the colour as well. Sometimes with colours they are more friendly to the environment. But icons are the most attention grabbing.
- I liked the plant - based is a nice word. I also like the icons otherwise it's not interactive.
- Cardboard colours and any of these logos. And the green stood out more.
- Definitely the colours stood out. The green was attention grabbing. The green icons too.