THE EFFECT OF ECO-LABEL PLACEMENT ON SUSTAINABLE BUYING BEHAVIOUR: AN EYE-TRACKING EXPERIMENT

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Abstract

Purpose - There is debate on the effectiveness of eco-labels on sustainable purchase behaviour and unclarity about role of visual attention and its antecedents.

Design/methodology/approach – In an experimental study with a between-group design, 60 participants were asked to look at a picture of the product packaging of tea while their eye-movements were measured. The test-group looked at a manipulated picture in which the eco-label was strategically placed close to the brand name, while the control-group looked at the picture with the original eco-label placement. An additional survey revealed their purchase intention for eco-labelled products and perceptions of trust. For the analysis partial least squares structural equation modelling was used.

Findings - The findings of this study indicate that strategic label placement has a positive effect on visual attention when it is measured with the time to first fixation, which does not hold for dwell time. Moreover, it disproves the expected moderating role of trust in eco-labels on the relation between label placement and visual attention paid to eco-labels, and effect of visual attention paid to eco-labels as a driver of purchase intention for eco-labelled products.

Research implications – To extent marketing and sustainable consumption literature, the findings provide new insights in the role of label placement, visual attention, and trust on sustainable purchase behaviour.

Managerial implications – By investigating the role of label placement, visual attention and trust, marketeers and policy makers could improve the communication of sustainability claims via eco-labels.

Keywords - *Eco-labelling – Sustainable consumption – Visual attention - Trust*

Inhoud

1. Introduction

As the world population, as well as our standards of living, are increasing over the years, running out of natural resources has an unimaginable impact on our well-being. We are currently using more natural resources to meet the demands of consumption worldwide than our planet can replace each year (Iannuzzi, 2017). Natural resources can be given a broad definition that includes anything that occurs in nature that can be used for producing something else (United Nations Environment Programme & International Resource Panel, 2019). The United Nations conceived sustainable development goals as a shared blueprint for peace and prosperity for people and the planet. One of these goals specifically relates to natural resources usage, namely: 'sustainable development goal 12: responsible consumption and production' (United Nations, n.d.). According to Filho et al. (2020), not achieving this goal by seeing a decoupling of economic growth and natural resources use would imply in a bigger global material footprint, putting much pressure on the environment. If we continue our consumption habits and the world population increases to 9.6 billion by 2050, three planets are required to provide the natural resources to sustain our current lifestyles (United Nations, n.d.). By encouraging consumers to change their buying behaviour we can reduce the extraction and use of natural resources. Curren and Metzger (2017) define sustainability as being fundamentally concerned with the impact of our present ways of life on opportunities to live well in the future. As natural resources are scarce and the world population is constantly increasing (Worldometer, 2021), sustainable behaviour has become increasingly important. Sustainability has been a hot topic among consumers and marketeers.

An impactful type of sustainable behaviour is sustainable buying behaviour, which is primarily concerned with consumers' purchase decision for ecologically friendly products, which are presumed to be environmentally safe, conservable, and avoiding excessive packaging and harmful stuffs that are injurious to people and eco-system (Jaiswal & Singh, 2018). Eco-labels have been introduced as a means to drive a widespread transition towards more sustainable lifestyles (Horne, 2009). A way of showing consumers that the manufacturer of a product took into account the use of few natural resources and ensure low emissions is by using eco-labels on product package design. Several definitions of eco-labels are used. The Global ecolabelling network (n.d.), states that eco-labels identify products or services proven to be environmentally preferable within a specific category. Eco-labels are also defined as marks placed on product packaging or in e-catalogues that can help consumers and institutional purchasers quickly and easily identify those products that meet specific environmental performance criteria and are therefore deemed "environmentally preferable" (Galarraga Gallastegui, 2002; Meis-Harris et al., 2021; The United States Environmental Protection Agency, n.d). These certified eco-labels have been used on product packaging since 1978 (Watanatada, 2011). Nowadays, there is renewed interested in eco-labels, as there is a global trend happening called 'eco-wakening' (Horne, 2009; World Economic Forum, 2021). This means that consumers are realizing that something has to change, and they are

driving sustainability now (World Economic Forum, 2022). An emerging topic is the effectiveness of eco-labels in both informing consumers on sustainability efforts and steering their purchase decisions in a 'wild west' of hundreds of different eco-labels (The Guardian, 2018), and enhancing organisations to make their production process more sustainable (Changing Markets Foundation, 2018).

1.1 Practical relevance

There is a lot of attention for eco-labels, from policy makers, consumers, and marketeers. Each year, consumers, companies, and communities worldwide celebrate World Ecolabel Day by discovering the ecolabels available in their own countries, buying, and using third-party certified products and services, and sharing the good news with family, friends, neighbors, and coworkers (Global Ecolabelling Network, n.d.). Marketeers frequently use eco-labels as a strategy for enjoying a competitive advantage and strengthening brand image (Kirilova & Vaklieva-Bancheva, 2017; Sharma & Kushwaha, 2019). Furthermore, the European Union has even developed its own eco-label to promote goods and services with reduced environmental impacts all over their life cycle in the European Market (European Commission, 2020). However, according to Iraldo et al. (2020), despite the strengths and potential effectiveness of eco-labels, there have been severe challenges in guaranteeing and improving their ability to achieve high environmental sustainability goals. Some failures and limits need to be overcome as they hinder their optimal effectiveness (Iraldo et al., 2020). These barriers hindering the effectiveness and full potential of eco-labels are highly relevant, as improvement could contribute to reaching sustainable development goal 12 as drawn up by the United Nations.

First, a large percentage of consumers consider themselves to be supportive of sustainability, but this does not necessarily translate into related purchase behaviour (Frank & Brock, 2018; Park & Lin, 2020; Ramirez 2013). This is often referred to as the attitude-behavioural intention gap in sustainability literature (Vermeir & Verbeke, 2006). According to the United Nations Report on the sustainable development goal of sustainable consumption and production, the world actually continued to use natural resources unsustainably (United Nations, 2020). Second, only a small amount of consumers' attention is paid to the eco-labels, which might be related to the design of packaging (Song et al., 2019). This is problematic, as clearity and recognizability appear to be a precondition for success (Wageningen University & Research, 2021). Third, nowadays there is a lack of clear and trustworthy information (Deloitte, 2021). The Edelman Trust Barometer (2020) indicates that 70% of those surveyed state that trusting a brand is now more important than it has been in the past. The importance of consumer trust is also reflected in the findings that consumers utilize labels in decision-making only if they trust the message conveyed by ecolabels (Oates at al., 2008; Taufique et al., 2019). Morris et al. (2020) researched consumer trust in sustainability very recently and found that customers have grown doubtful about sustainability information provided by brands themselves. Their survey reveals a significant 83% of respondents would be more likely to trust a product's sustainability claim if it had been verified by a

third party (Morris et al., 2020). The lack of trust is actually stopping consumers from sustainable buying behavior (Deloitte, 2021).

In short, the world is using more natural resources than it can replace which calls for sustainable buying behaviour in the field of consumption. The problem here is that three barriers are detrimental for the effectiveness of eco-labels: (1) consumers support sustainability efforts, but this does not translate into their actual buying behavior, (2) consumers do not pay enough attention to eco-labels, and (3) due to green washing they have lost trust in sustainability claims on product packaging. If we want to help consumer behaviour change towards sustainability, more research on this topic is needed (Young et al., 2009). A better understanding of the role of these barriers in the visual processing of eco-labels, in order to unlock the full potential of eco-labels and their contribution to sustainable production, consumption and marketing. This could help improve the communication and visibility of environmental claims on product packaging to make use of the full potential of eco-labels as a means towards more sustainable lifestyles.

1.2 Scientific relevance

The scientific relevance of this thesis is threefold and relates to debate on the eco-label effectiveness and the aforementioned barriers in unlocking the full potential of eco-labels: a lack of visual attention paid to eco-labels and the role of trust.

First, there is no consensus on eco-label effectiveness in the literature, which requires further study. Consumers' visual attention for product elements and the information processing can be seen as part of the customer experience. This is comprised of the cognitive, emotional, physical, sensorial and social elements that mark the customer's direct or indirect interaction with market actors (de Keyser et al., 2015). With a holistic perspective, this can be seen as a process that consumers go through, what we now call the "customer decision journey" or "customer purchase journey (Lemon & Verhoef, 2016). Visual attention is a sensorial element in the interaction between the customer and the information provided by the organisation via eco-labelling. A critical determinant of consumers' responses to sustainable products is the ability with which consumers are initially able to categorize the product as environmentally friendly or not (Pancer et al., 2015). Eco-labels provide this information, but several studies on the effectiveness of eco-labels, in some cases related to visual attention, came forward with contradicting results. Vlaeminck et al. (2014) and Tang et al. (2004) state that eco-labels do promote eco-friendly consumption. However, other studies conclude that eco-labels attain visual attention of customers, but that it does not translate into more sustainable buying behavior (Fiala et al., 2016; Waechter et al., 2015). There are also studies that came forward with results indicating that consumers may fail to realize the existence of eco-labels and do not always pay visual attention to them (Ratner et al. 2021; Song et al., 2019). Orquin and Mueller-Loose (2013) suggest that fixations driven by visual salience might influence choice by gate-keeping the alternatives that enter the consideration set. More

insight is needed on the role of visual attention paid to eco-labels and the purchase intention of eco-labelled products, in order to establish whether this could be a possible driver of improving eco-label effectiveness. Such insights would provide evidence on whether it is useful to aim at increasing visual attention paid to eco-labels to increase sustainable consumption. This also contributes to the knowledge on how this product attribute on packaging influences the customer experience and their decision-making process regarding food consumption.

Second, very little visual attention is paid to eco-labels when consumers visually process product packaging (Song et al., 2019). They state that this may be due to the distraction from competing information on the product packages and the short time consumers spent on product evaluation. Consumers cared more about other product attributes such as price, product appearance, and nutrition tables (Song et al., 2019). Previous research identified that placement of product attributes on the packaging plays an important role in the attention paid to these attributes (Graham & Jeffery, 2011; Sundar & Noseworthy, 2014). Orquin et al. (2019) confirm these findings and highlight the importance of label placement, as their study identified that the distance to center of product packaging influences the probability of consumers fixating a product packaging element. However, there is a lack of research on the effect of specifically eco-label placement on the visual attention paid to eco-labels on product packaging. Other studies have already looked into the effect of placement of nutrition labels (Biswas & Romero, 2014; Christoph et al., 2016; Grunert & Wills, 2007) and warning labels (Halim, 2019; Hilton, 1993) on the attention paid to the label. However, there is an important difference between the types of labels, which are the determinants of consumers' attention. According to Rawson et al. (2008, as cited in Bialkova & van Trijp, 2010) consumers rely on food labels when they have a specific reason (such as locating products for dietary needs). As attention to labels is often related to consumer goals, which differ for all label types, the effect of placement on the purchase intention could differ. Strategic placement on product packaging might improve the visual saliency of the label, which is directly linked to the level of visual attention (Itti & Koch, 2001). Insights in this relation could identify if strategic eco-label placement could improve visual attention paid to eco-labels, which in turn could be beneficial for promoting sustainable consumption.

Third, there is a lack of research in the field of eco-labelling combining the two types of visual attention dimensions. Two types of factors can be differentiated in the field of visual attention: bottom-up factors, which are the characteristics of the stimulus itself; and top-down factors, which are previous ideas about the product that consumer already had (Pieters and Wedel, 2004). These factors are often described separately and are thought to involve distinct neural mechanisms and anatomic substrates (Katsuki & Constantinidis, 2014). Conner et al. (2004) state that top-down attention interplays with bottom-up signals when we need to look for something specific and Katsuki and Constantinidis (2014) even found evidence for looking at these factors as intricately intertwined. Many studies on eco-labels are either focused mainly on bottom-up factors (e.g. Rihn et al., 2019; Vlaemink et al., 2014) or top-

down factors (e.g. Grankvist et al., 2004; Ratner et al., 2021). Only a few have combined both (e.g. Orquin, 2019; Song et al. 2019; Suki, 2013). As mentioned before, one of the barriers regarding eco-label effectiveness is a lack of trust, which can be categorized as a top-down variable. The studies combining top-down and bottom-up variables do not provide enough insight, as these studies have not looked at the moderating role of trust as a top-down factor. Therefore, research is needed that not only combines top-down and bottom-up factors, but studies whether there is an interplay of specifically trust as a top-down factor on the effectiveness of bottom-up factors on the visual attention paid to eco-labels.

In short, this thesis addresses three scientific gaps. First, there is debate in the existing literature on the effectiveness of eco-labels. Second, there is a lack of research on the effect of specifically eco-label-placement on product packaging and the purchase intention of eco-labelled products. Third, there is little research combining bottom-up and top-down variables in an eco-label context and a gap as no other studies have looked at the interplay of the top-down factor trust on the effect on visual attention of bottom-up factors. The research question is: *"What is the effect of eco-label placement and trust on the visual attention paid to eco-labels and how does this relate to purchase intention of eco-labelled products?"*

1.3 Contribution of this study

In order to address both the theoretical and practical need, the aim of this study is to gain more insight in the effect of visual attention paid to eco-labels on the purchase intention of eco-labelled products and to identify the interplay of trust. This enriches the literature in the fields of marketing and sustainable consumption by conveying research on label placement to an eco-labelling context; exploring combining top-down and bottom-up factors on visual attention paid to eco-labels and specifically identifying the role of 'trust'; and contributing to the ongoing debate on eco-label effectiveness by shedding light on visual attention on purchase intention with an eye-tracking approach. In practice, the goal is to steer consumer purchase behaviour towards more sustainable products. This study contributes by providing new insight on the role of visual attention, and its antecedents, on the purchase intention for eco-labelled products. These insights could improve eco-label effectiveness and the communication of sustainability effort by marketeers and policy makers.

First, a theoretical framework will be provided, which gives an overview of the state-of-the-art literature on visual marketing, the antecedents of visual attention and eco-labelling. This can be found in chapter 2. Next, in chapter 3, the methodology is presented. Here, the research design, experimental setting, research ethics and planning are described. Subsequently, the results of this study will be addressed in chapter 4, and the most important analytical output will be discussed. Eventually, the answer to the research question will be presented in chapter 5. Afterwards, chapter 6 will consider the limitations of this study and recommendations for future research.

2. Conceptual background and hypotheses development

This chapter contains the hypotheses development and an overview of the state-of-the-art literature that form the foundation of these hypotheses. Section 2.1 provides context by giving an overview of relevant literature on the holistic approach of the customer experience, focusing on the customer journey and touch points. In section 2.2 is devoted to the hypotheses development.

2.1 Conceptual background

As stated in the scientific relevance visual attention is a sensorial element that can be seen as a part of the customer experience. More specifically, in an eco-label context, organisations aim to enhance sustainable purchase behavior by providing product packages with eco-labels to inform customers on their sustainability efforts. This is an interaction that customer experience in their customer journey and decision-making process. Before looking into the effectiveness of visual attention paid to eco-labels and the antecedents of the visual attention, the key principles of the customer journey and the decision-making processes are set out. The role of touch points is also included, just as the necessary conceptual background on visual attention.

Customer journey

The term customer journey commonly refers to a process or sequence that a customer goes through to access or use an offering of a company (Følstad & Kvale, 2018; Tax et al., 2013). Cognitive reactions during this journey include the customer thoughts, emotional reactions include the way the customer feels, and the behavioural reactions comprise their way of acting as a result of the experience. The customer journey became important for competition as organisations have been reacting to customers, trying to anticipate their next moves and position themselves in shoppers' paths as they navigate the decision journey from consideration to purchase (Edelman & Singer, 2015). The focus on the customer journey is emphasized in the academic field, cause adjusting the potential interactions with customers could improve the overall customer experience (Lemon and Verhoef 2016). An important shift in the company approach towards the customer journey can be identified: rather than merely reacting to the journeys that consumers themselves devise, companies are now shaping their paths: leading rather than following (Edelman & Singer, 2015). This is in line with the notion of Gulati and Oldroyd (2005) that there is an increased customer centricity and focus on the customer at the overall firm level. Several managerial tools were invented to support this customer centricity perspective, such as personas and the jobs-to-be-done perspective (Lemon & Verhoef, 2016). Shah et al. (2006) even take it a step further and state that customer centricity enables firms to achieve a competitive advantage that has proven to be sustainable and not easily countered by competition. The remaining question is *how* companies can improve the customer journey to achieve positive thoughts, emotions, and behavioural reactions of the customer. The answer to this question lies in the decision-making process of consumers.

Consumer decision making

Consumers are faced with making choices every day of their life: What to wear? What to eat? What to do? Consumer decision-making can be defined as a consumer task of choosing between a set of alternatives, each described by several attributes (Bettman et al., 1991). Research on consumer decision making has been conducted for decades. For example, the Anderson model of decision making, dating from 1965, focused on the role of provided information and included several constraints that could influence decisions (Panwar et al, 2019). According to this model informative attributes are filtered using several types of sources. Then the filtered information is assessed with personal aspects such as beliefs, personality, feelings and previous experiences. Finally, some constraints to the purchase decision were identified, namely income, budget priorities, physical capacity, household capacity and other purchase decisions. This model identified many variables influencing the purchase decision, however it fails to consider determinants for repeated purchase decisions. A more recent study of Chiu et al. (2012) focused specifically on understanding repeated purchase intentions. These models paved the way for research on customer-decision making by identifying antecedents of purchase choices, such as trust and information. Nowadays, the antecedents identified by Anderson (1965, cited in Panwar et al, 2019) and Chiu et al. (2012) are still relevant and often researched.

Consumer decisions also impact marketeers and policymakers (Bettman et al., 1991; Panwar et al., 2019). Hawkins et al. (2007) even state that all marketing decisions are based on assumptions and knowledge of consumer behaviour. The main goal of marketing is to reach consumers at the moments that most influence their decisions when consumers are open to influence, so-called "moments that matter" or "touch points" (Stankevich, 2017). Customer decision making is an important process for marketeers as it is the basis of purchase behaviour (Stankevich, 2017). With this respect the model of Nicosia and Mayer (1976) forms an interesting basis, as it focuses on consumer attributes in relation to the firm and the role of marketing messages. It can be derived from this model that the decision-making process connects the consumer and marketeer, as marketeers aim to influence the decisions of the consumer and the consumer decisions have implications for the firm. This connection is the core of the customer experience, which comprises the direct or indirect interaction between a customer and a firm (De Keyser et al., 2020; Gentile et al., 2007; Schwager & Meyer 2007).

Touchpoints

Lemon and Verhoef (2016) state that the customer journey is the best way to understand the customer experience and emphasize an increased focus as customers now interact with firms through several touch points in multiple channels and media, resulting in more complex customer journeys. Touchpoints can be defined as the moments of (potential) interaction between the customer and the firm in the customer journey. In an era driven by the internet, firms are confronted with accelerating media and channel fragmentation, and omnichannel management has become the new norm (Lemon & Verhoef, 2016).

This means that customers are facing many touch points in their day-to-day lives. Three categories of touchpoints can be distinguished: brand owner touchpoints (brand advertising), retail touchpoints (retailer advertising and in-store communications) and third-party touch points (word-of-mouth, peer observation and traditional earned media). This study focuses on using product packaging to get visual attention for eco-labels, which can be categorized as a brand owner touch point. To improve this brand-owned touch point and influence the customer experience, it is important to learn more about the role of visual attention on the purchase behaviour.

Visual attention

The customer experience can be seen as a multidimensional construct, including five dimensions: sensorial; emotional; cognitive; pragmatic; lifestyle; and relational (Gentile et al., 2007). Product packaging is aimed at gaining visual attention of consumers, for which it can be categorized in the sensorial dimension of the customer experience. The sensorial dimension is the component of the customer experience whose stimulation affects the senses (Gentile et al., 2007). One of the first scientists that mentioned attention was the American philosopher and psychologist William James in 1980. He defined attention as "the taking possession by the mind, in clear and vivid form, of one out of what seem several simultaneously possible objects or trains of thought, localization, concentration, of consciousness are of its essence. It implies withdrawal from some things in order to deal effectively with others and is a condition which has a real opposite in distraction" (Posner & Petersen, 1990). More specifically visual attention is typically described as the allocation of an individual's processing capacities to stimuli in their visual field (Bundesen, Habekost, & Kyllingsbaek, 2005).

The human brain is incapable to process all the amount of received information (Al-Azawai, 2019). Therefore, it focuses only on the other important parts (Al-Azawai, 2019). Our eyes have limited acuity to a small part of the visual field (Carter & Luke, 2020). Hence, getting and maintaining attention is probably one of the biggest challenges for markeeters (Weima, 2019). Visual attention has been studied for many reasons in several fields of research, for example in psychology (Fox, 1993; Janelle & Hatfield 2008; Memmert, Simons & Grimme, 2009), neuroscience (Kanwisher & Wojciulik, 2000; Lockhofen & Mulert, 2021), and marketing (Rumpf et al., 2020). A thing remains the same in all these studies, is the neuronal mechanism for visual attention. Simply said, the information enters via the visual cortex of the brain and is processed along the cortical areas (Itti & Koch, 2008). The actual control of deploying attention takes place in the dorsal stream, which results in eye-movements towards the elements of interest (Itti & Koch, 2008). Research has been conducted to see whether people are able to direct their eye-movements to a visual element and pay attention to another visual element. The findings of Hoffman and Subramaniam (1995) shows that subjects cannot move their eyes to one location and attend to a different one. It is also important to note that there is a difference between visual attention

and awareness. We are conscious of many inputs but, without attention, this conscious experience cannot be reported and is quickly erased and forgotten (Lamme, 2003).

2.2 Hypotheses development

First, in section 2.2.1 the conceptual model is explained. Then, section 2.2.2 focuses on the relation between visual attention and purchase behavior. In 2.2.3 the antecedents of visual attention are discussed. Attention is paid to two different dimensions of visual attention, namely top-down factors, and bottom-up factors. First the effect of the bottom-up factor label placement on visual attention is explained and then attention is devoted to the effect of the top-down factor label trust on this relation.

2.2.1 Conceptual model

This study mainly concerns the effect of 'eco-label placement' as the independent variable on the 'purchase intention of eco-labelled products' as the dependent variable. As previous research found a significant relation between the attention for eco-labels and purchase intention of eco-labelled products, the attention for eco-labels is incorporated in the model as a mediating variable. Furthermore, this study is interested in identifying a possible moderating effect of the top-down factor 'Trust in eco-labels' on the relation between eco-label placement and the attention for eco-labels. Figure 1 provides a visualization of the hypotheses and the main concepts of this study.

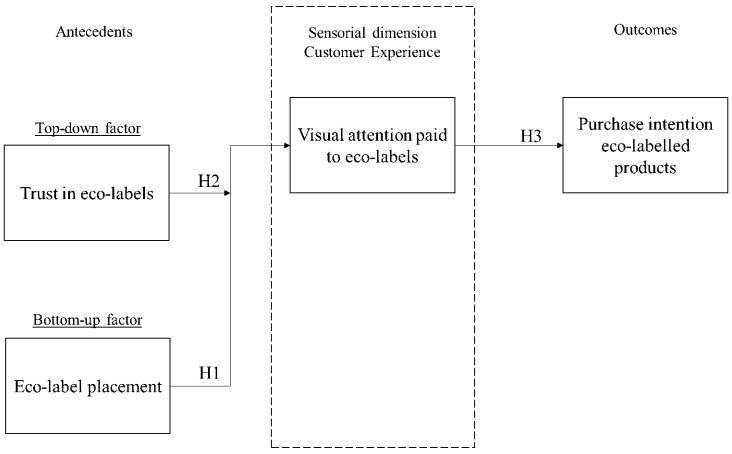


Figure 1 Conceptual model and hypotheses

2.2.2 Antecedents of visual attention

In the field of visual attention two types of factors can be differentiated: bottom-up factors, which are the characteristics of the stimulus itself; and top-down factors, which are previous ideas about the product that consumer already had (Pieters and Wedel, 2004). According to Connor et al. (2004) bottom-up attention alerts us to salient items in our environment, but top-down attention modulates bottom-up signals when we look for something specific. Theories and psychophysical evidence on neural processes underlying the bottom-up and top-down attention have been established, favoring the idea that top-down and bottom-up factors interact to control allocation of attention (Connor et al., 2004; Folk et al., 1992;

Ogawa & Komatsu, 2004). Hence, this research combines the bottom-up variable 'Eco-label placement' and the top-down factor 'Trust in eco-labels' with regard to visual attention paid to eco-labels. A detailed theoretical review on both types of factors is provided.

Bottom-up factors

Bottom-up factors are often found in marketing stimuli and result in visual attention on an involuntary basis (Pieters & Warlop, 1999). This section focuses on bottom-up factors in relation to sustainability. First, attention is paid to the use of sustainable cues and product packaging to attract visual attention and inform customers. Second, a background on the use of eco-labels on product packaging is provided. Third, studies on the effectiveness of eco-labels on visual attention and sustainable consumption are compared. Finally, more in-depth attention is paid to the role of label placement.

Sustainable cues and product packaging

Companies often provide stimuli on product packaging to gain visual attention of customers (Rumpf et al., 2020). With regard to sustainable buying behaviour, Pancer et al. (2015) argue that a critical determinant of consumers' responses to sustainable products is the ability with which consumers are initially able to categorize the product as environmentally friendly or not. In order to enable all customers to make this distinction between 'normal' products and sustainable products, companies could provide them with easy-to-understand information on sustainable efforts (De Boer et al., 2006). This is in line with meta-analytic reviews, that suggest that information has a significant influence on pro-environmental actions, such as sustainable consumption (Delmas, et al., 2013; Osbaldiston and Schott, 2012). The most obvious way of informing customers about sustainable efforts in the production of a certain product is by adjusting the product packaging.

Many studies found that packaging can readily give rise to thoughts about sustainability (Lindh et al., 2015; Steenis et al., 2017; Van Dam and Van Trijp, 1994). Nowadays, it is clear that these findings are used in practice, as environmental-friendly products are easy to recognize in the shelves because of the appearance of the product packaging. Besides this first sustainable appearance, companies often provide information and sustainability claims on product packaging. De Boer et al. (2006) conducted a study that focused on how on-package information cues (which are all bottom-up stimuli) are recognized, understood and valued by customers. They state that an organic logo is easy to recognize, but not always completely understood; and that products with these logos and many details were considered more expensive, although the prices were similar to other products. Furthermore, there is a positive effect of using the colour green on product packaging and the perceived sustainability of the product. However, Lim (2017) adds that this effect backfires if consumers are aware that the color has been used to bias them. Furthermore, Steenis et al. (2017) identified that changing the packaging material has not only effect on the perceived sustainability, but also on perceived taste and product quality. To sum up, product packaging has a crucial role in expressing sustainable cues by providing

information via logos, textual details, brand, color and even packaging material. An emerging topic in research is the use of eco-labels to inform consumers and steer their purchase decision (Testa et al., 2015).

Types of eco-labelling

Sustainable development on a global scale has been on the agenda of the United Nations since 1992, when it was the main theme of the 'Earth Summit' conference (United Nations, n.d.). Resulting from this conference national policies were developed to promote sustainable behaviour, in which eco-labelling was opted as a promising way of encouraging sustainable production and increasing consumer awareness (Erskine & Collins, 1997). Packaging plays a key role in reducing the environmental impact of both green products and logistics. Ecolabels are often integrated into packaging and serve as a promotional tool as well (Dangelico and Vocalelli, 2017).

The International Organization for Standardization (ISO) categorizes several types of eco-labels: Type I (environmental labelling) includes multi-criteria third-part programmes intended for end consumers; Type II (self-declared environmental claims) includes claims where there are no criteria nor labelling schemes; and Type III (environmental declarations) includes declarations for specific aspects of products using a life-cycle approach and are mostly used business-to-business (Bratt et al., 2011; International Organisation for Standardization, 2019). This study focusses on Type I eco-labels. These labels are endorsed by a third-party and focus on consumers, which indicates that they can really contribute to increasing sustainable consumption. Since eco-labels are used to promote sustainable consumption, the effectiveness of the use of these eco-labels has been on the research agenda in the field of sustainability and marketing.

Eco-label effectiveness

The effectiveness of eco-labels should be placed in the broader context of the attitude-intention gap in consumers' sustainable buying behavior, as described by Miniero et al. (2014). One would expect that consumer's with a positive attitude towards sustainability would intent to purchase sustainable products, but this does not express itself in their actual buying intentions. The intention to purchase green products is the result of a trade-off between the environmental issues and the individual consequences of a particular purchase. Therefore, a strong weight of individual consequences may explain why some consumers with high environmental concern do not purchase accordingly (Follows & Jobber, 2000). White and Simpson (2013) state that when encouraging consumers to engage in sustainable behaviours, markeeters and public policy advocates often capitalize on the persuasive power of social norms. Furthermore, they add that marketing communications should ensure a match in terms of goal compatibility, involving activating the collective self and making injunctive or descriptive normative appeals or activating the individual self and making benefit or descriptive appeals to consumers.

In today's market more and more companies are trying to communicate their sustainability efforts towards potential customers, as can be derived from all kinds of sustainable cues and green product packaging. As eco-labels are the result of national policies based on the global United Nations conference on 'Earth Summit', it is useful to identify their contribution to sustainable purchase behavior. However, studies that are conducted with retrospect to this question came forward with different results. Vlaeminck et al. (2014) state that the multicriteria label with a standardized score significantly promotes eco-friendly food consumption. Waechter et al. (2015) also concluded from their experiment that the ecolabels did have a positive effect on consumer's attention, but they added that this did not translate to consumer buying decisions. This is in line with the research of Fiala et al. (2016), who found that the participants in their eye-tracking experiment did notice the eco-labels, but it only had a small or zero effect on the consumer behaviour. In 2019, Song et al. thought that the effectiveness in informing consumers on choosing environmentally friendly products was still unclear. Therefore, they conducted an experiment in a naturalistic shopping environment, using eye-tracking glasses, to really capture actual consumer behaviour and preferences. Their results indicate that consumers do not actively look for eco-labels in their decision-making process, and that even if consumers have knowledge about ecolabels, they may still fail to realize the existence of ecolabels in their daily lives. A recent study of Ratner et al. (2021) came forward with comparable results. A bottom-up factor, which might play a crucial role, which has not been investigated before in relation to visual attention is the importance of eco-label placement on the product packaging.

(Eco-)label placement

Studies have shown a positive relation between visual attention and the valuation of attributes (Armel & Rangel, 2008; van Loo et al., 2018). Many studies in the field of marketing focus on identifying factors influencing getting attention. For example, Peschel and Orquin (2013) found that surface size and visual saliency result in a higher likelihood of attention. Although there is a lack of research on eco-label placement, there have been researchers who studied the effect of the placement of other label types on visual attention. Christoph et al. (2016) found that nutrition label awareness and use did not change with label placement or over time. However, Biswas and Romero (2014) did find that the placement of a nutritional label on the left (vs. right) of the product results in higher nutritional valuations of the product. This is in line with the study of Graham and Jeffery (2011) who state that the placement of the nutrition table on product packaging influence how much attention is paid to it. Grunert and Wills (2017) add that placing nutrition information on the front of packages is more effective than information positioned on the side or back of packages. Hilton (1993) and Halim (2019) studied the effect of label placement for warning labels. Warnings printed on the front of the container were found to be easier to notice than warnings placed on the back or sides, and warnings printed horizontally were significantly more noticeable than warnings printed vertically (Hilton, 1993). Halim (2019) added that the location of warning labels on a product, or in relation to other packaging design elements, for example included

in the instructions for use, can also influence whether the warning label can be seen and whether or not the recipient is aware.

Based on the studies on the placement of nutrition labels and warning labels, it is clear that label placement in most cases influences the customers' visual attention. Making the eco-label more visible for customers could increase their attention, which is likely to affect the purchase intention of the eco-labelled product. A concept which is closely related to this visibility is visual saliency. Visual saliency can be defined as the conspicuity of a visual object relative to its surroundings (Orquin et al., 2019). Itti and Koch (2001) identified a link between visual saliency of elements and the amount of time consumers fixate on the salient element. They argue that our ability to orientate rapidly towards salient objects comes from its evolutionary function to quickly detect prey, mates or predators (Itti & Koch, 2001). Nowadays, this results in salient attributes on product packaging gaining more visual attention than less salient attributes (Bialkova & van Trijp, 2011; Orquin et al., 2019). As previous literature states the importance of saliency for the attention paid to product elements, this study aims to identify the effect of visual saliency of eco-labels on the attention paid to the eco-label. Nowadays, most eco-labels are placed in a bottom corner of the product packaging. In the study of Drexler et al. (2017) the zone getting the most attention was in most cases the brand. Besides, Orquin et al. (2019) studied the placement of product elements and found that the distance to center of product packaging influence the probability of consumers fixating a product packaging element. The brand is often located in the center of the product packaging. Therefore, this study aims to find out whether more salient placement of an eco-label near the brand name on the product packaging increases visual attention paid to the eco-label. The following hypothesis on eco-label placement has been developed:

H1: There is a positive effect of salient placement of eco-labels near the brand name, in contrast to placement of eco-labels further away from the brand name, on the visual attention paid to an eco-label.

Top-down factors

Top-down factors are related to personal goals and intentions and result in visual attention related to long term visual memory (Lee & Ahn, 2012). This section focuses on the top-down factor 'trust' in relation to sustainability. First, the broader context of sustainable consumption is explained. Second, studies on green washing and consumer trust are compared. Finally, more in-depth attention is paid to the role of trust in eco-labels.

Green washing and consumer trust

Marketing sustainable products is increasingly mentioned in the globalization process of the economy, because of its potential for obtaining a competitive advantage (Kirilova & Vaklieva-Bancheva, 2017). There are many opportunities for companies to add cues on the packaging of products to communicate sustainable efforts, which are really important to influence customer recognition and their purchase

intention (Rees et al., 2019). However, some companies act in a way that makes people believe that a they are doing more to protect the environment than they really do. This is often described as 'green washing'. (Cambridge Dictionary, n.d).

Consumers rely on their own lay beliefs and can be easily misled by salient cues that may not be very relevant for objective environmental impacts (Steenis et al., 2017). This can result in consumers buying products that claim to be sustainable, which are in fact unsustainable products with misleading marketing in terms of environmental claims or cues. However, more and more consumers are aware of green washing activities. This explains that consumers are becoming very discerning and losing trust in corporations in general as many firms profess to protect the environment but fail to demonstrate that in their actions and performance (Nyilasy et al., 2013). Consumer trust can be defined as the expectations held by the consumer that the service provider is dependable and can be relied on to deliver on its promises (Sirdeshmukh et al., 2002). Trust has become increasingly important, because of the growing importance of relationship marketing and the heightened interest in the role of trust in fostering strong relationships (Sirdeshmukh et al., 2002). Furthermore, consumer trust is an important determinant of brand loyalty (Lau & Lee, 1999).

The concept of green trust is concerned with consumers' trust in environmental efforts and green marketing. When consumers feel an increased sense of skepticism, there is a negative association between green marketing and purchase intentions (Albayrak et al. 2011; Szabo & Webster, 2020). Other studies add that consumer skepticism is also negatively associated with green trust (Aji and Sutikno, 2015; Chang & Chen, 2008). Without confidence in the firms' claims, consumers are unable to decide their green purchasing, since they do not know who or what to trust (Chang & Chen, 2008). Green washing activities could therefore pose a problem for truly sustainable companies as it can be derived from these studies that it enhances consumer skepticism, which has negative impact on green marketing, green trust and green purchase intentions. An increasingly used method of providing consumers trustworthy information regarding sustainable consequences using product packaging, is by using eco-labels, as they are used as certification marks.

Trust in eco-labels

Eco-label trust can be categorized as trust in the label itself and trust in the organizations behind the label that set the standards for being able to use the labels in promotions for products and services (Khachatryan et al., 2021). Multiple studies confirm that trust in eco-labels is positively related to the willingness to pay or the purchase intention of eco-labelled products (Darnall et al., 2018; Daugbjerg et al., 2014; Taufique et al, 2017). Oates et al. (2008) even state that consumers utilize information sources in decision-making only if they trust the message conveyed by the information source. Gorton et al. (2021) looked specifically at eco-label trust and found that trust positively affects the use of the eco-labels, and knowledge on the third-party certification positively affects the trust in, and use of, eco-

labels. In fact, consumers only pay attention to and use labels in their buying decisions only if they trust them (Taufique et al., 2019; Thøgersen, 2000). Neurological studies have shown that bottom-up stimuli are able to directly impact attention, while top-down factors often moderate such influence. For example, Sawaki & Katayama (2008) found that the top-down attentional mechanism has a strong influence and provides a competitive advantage for objects with an attended feature. Melloni et al. (2011) added that top-down attention moderates bottom-up saliency and therefore suppresses the detrimental effects of highly salient distractors. In line with these studies on visual attention, it could be argued that the top-down factor 'trust', moderates the effect of the bottom-up factor 'eco-label placement' on the visual attention paid to eco-labels. Therefore, the following hypothesis on eco-label trust has been developed:

H2: Trust in eco-labels has a moderating effect on the relation between strategic eco-label placement near the brand name and the visual attention paid to an eco-label, such that a higher level of trust strengthens the effect of strategic eco-label placement on visual attention.

2.2.3 Outcomes of visual attention

Visual attention and purchase behavior

The reason for markeeters to be interested in studying and measuring visual attention is because they aim to attract the attention of customers by providing stimuli. Previous studies have shown that more attention to a product concept alternative and more attention to the attributes of a product concept alternative lead to a higher likelihood of the alternative to be chosen, more specifically visual attention plays an active part in decision making and purchase likelihood (Khachatryan et al. 2017; Meyerding & Merz, 2018; van Loo et al., 2021). Visual attention can be measured with eye-movements, in which fixations (pauses over informative regions of interest) and saccades (rapid movements between fixations) can be distinguished (Salvucci & Goldberg, 2000). The relation between visual attention and purchase intention has been studied in various contexts. Pieters and Warlop (1999) address this relation in the context of brand choice. They found that fixation duration is an important predictor of brand choice, as brands with higher consumer fixation durations have a higher likelihood of being chosen than brands with lower consumer fixation durations (Pieters & Warlop, 1999). Behe et al. (2015) support the link between visual attention and product selection, as products with display elements that received high levels of visual attention were more likely of being selected. This is in line with previous findings stating that the probability of an item being chosen depends on the amount of time consumers fixate on that item during the decision-making process (Armel & Rangel, 2008). Only a few studies have focused specifically on food choice (van Loo et al., 2018). Most studies confirm that visual attention and the food choice are positively related (Bialkova et al., 2014; Jantathai et al., 2013; Meiβner et al., 2016 and van Loo et al., 2015). Behe et al. (2015) add to the literature that the visual attention paid to specifically information signs had the most significant impact on product choice (Behe et al., 2015). Marketeers can disseminate information either through symbols or claims on labels (D'Souza et al., 2006). In green marketing efforts eco-labels are used to provide consumers information on sustainability efforts.

Previous research has found evidence for eco-labels enhancing the purchase intention of eco-labelled products (Tang et al., 2004; Sammer & Wüstenhagen, 2006).

Looking specifically at visual attention paid to labels, the literature indicates that "how long consumers look at labels" and/or ''how often they look at labels" provides a basis for determining the impact of such labels on purchase decisions (Goldberg, Probart, & Zak, 1999; Jones & Richardson, 2007). Graham and Jeffery (2012) looked at 64 labelled food items and found that participants spending a longer time looking at label components was found to be associated with positive purchase decisions. Monteiro and Loureiro (2019) conducted an eye-tracking study on wine labels and found that visual attention paid to these labels highly affects the purchase intention of the wine bottle. The premise underlying the use of eye-tracking technology is that there is a relationship between where an individual looks and what he or she is paying attention to or thinking about (Henneman et al., 2017). Only a few studies looked specifically at visual attention towards eco-labels and its effect on the purchase intention of eco-labelled products. Drexler et al. (2017) that found that visual attention towards eco-labels does not guarantee increased sales as 50% of consumers buy these products only in exceptional cases. On the other hand, van Loo et al. (2015) found that higher visual attention to sustainability labels resulted in higher willingness to pay for the product. Also, Göcer and Oflac (2016) expect a positive relation between visual attention and the purchase intention of these products, as knowledge provided by eco-labels, increases consumers' levels of awareness of eco-labels, thereby attracting their attention, which can ultimately trigger green consumerism. Based on the positive effect of eco-labels on purchase intention, the findings of van Loo et al. (2015) and the substantiated expectation of Göcer and Oflac (2016) the following hypothesis has been developed:

H3: There is a positive effect of the visual attention paid to an eco-label on the purchase intention of eco-labelled products.

3. Method

This chapter starts with the design of the research and an outline of the measurement methods, followed by an argumentation on the usefulness of eye-tracking as a research method. Then details on the participants are described. Afterwards, attention is paid to the research process flow and the research ethics. Finally, a brief description and the results of the pre-test and pilot-study are given.

3.1 Research design

This study uses a between-subjects experimental design to test the hypotheses about the relationships between the variables. It consists of two parts, the first being the eye-tracking experiment and the second part being the additional survey.

3.1.1 Stimuli of the experiment

To study the impact of eco-label placement on visual attention of consumers one product type is chosen as visual stimulus: tea bags. This product type is selected as many customers frequently buy tea and it is in a affordable price range. Furthermore, highly ranked eco-labels, such as Fairtrade and Rainforest Alliance, can often be found on the product packaging of tea. The eco-label used for the experiment is the Rainforest Alliance label. This label is in the top 10 of eco-labels in the Netherlands because of the high levels of ambition, transparency, and reliable controlling institution (Voedingscentrum, n.d).

Because of the interest in placement in the vicinity of the brand name, a picture of tea of a well-known brand, namely Lipton, was shown to the participants. They were instructed to just look at the product as if they were in a supermarket. The picture was shown for 12 seconds, as this is the average time spent at a product type display in supermarkets (Dickson & Sawyer, 1990; Hoyer, 1984). The test group looked at a picture with the eco-label strategically placed close to the brand name to improve its saliency. The control group looked at the original picture, where the product packaging remained unchanged. The visual stimuli of the experiment can be found in Appendix A. The participants were randomly assigned to either the test group or the control group.

3.1.2 Eye-tracking

Eye-tracking represents a promising source of behavioural data for innovation management researchers to provide new insights in the field of sustainable buying behaviour. Imai et al. (2019) state that visual fixations during hypothetical consumer choice, can be used to improve the prediction of actual purchases. The synchronisation between emotional response and visual focus provides a reliable method for understanding what is driving the reactions to a given stimulus (Hill, 2011). However, the eyes' movement during the decision-making process is partially driven by the requirements of a given task and partly by the properties of stimuli (Orquin and Mueller-Loose, 2013). Therefore, the only instruction given to participants was to look at the product as if they were in a supermarket.

As mentioned in the theoretical framework, eye-tracking has already been used in several studies on the effectiveness of eco-labels, in online as well as natural experimental settings. The main interest of this study is measuring the visual attention paid to the eco-label via eye-movements. Carter and Luke (2020) explain the functioning of eye-tracking devices as follows: Eye-trackers shine some light source into the eye, which produces a reflection on the cornea of the eye. The reflection and the center of the pupil are identified by the software. Then the point of gaze can then be estimated with a high degree of accuracy from the relative positions of the pupil and corneal reflection. The use of eye tracking and neuromarketing in marketing analysis is becoming increasingly popular and shows great potential for aiding market research, innovation, product development, advertising, sales, customer service, loyalty programs, and various other marketing topics (Santos et al, 2015).

3.1.3 Research process

To ensure reliability a standardized process of research was applied for each participant. The experiment took place in the same setting and with the same written instructions for all participants. The research process is shown visually in the flow depicted in Figure 2.

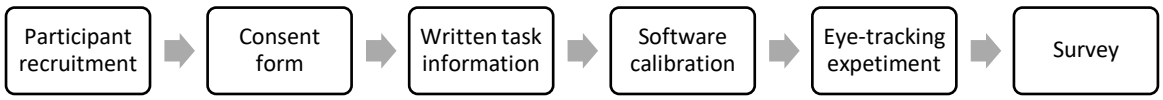


Figure 2 Research process flow

3.2 Measurement

For the eye-tracking experiment the online software 'Gazerecorder' was used. This software can provide several measures of visual attention and is easy-to-use. 'Gazerecorder' has been used in other scientific studies as well (e.g. Mahadas et al., 2021; Yousef et al., 2018). The 0.9 megapixel webcam of the laptop is used to observe the eye-movements of the participants. To make sure the collected is of the highest possible quality, the eye tracking software was calibrated for each individual participant. This is an automated feature of the programme and entails looking at dots appearing on the screen. Besides, the participants were asked to minimize other movements of their bodies and have an active work posture while feeling relaxed.

The experiment took place in an office space, where the chances of disturbance were considered low. Before measuring the movements, it is important to identify the so-called 'areas of interest', which are the regions in which the researcher is most interested in gathering data about (Holmqvist & Andersson, 2017). The area of interest in this study is the eco-label. In eye-tracking the interest is mostly on fixations. A fixation is when the eye remains still for at least 200-300 milliseconds, focusing on a particular aspect (Andrychowicz-Trojanowska, 2018). Visual attention can be measured with two different constructs: dwell time and the time to first fixation. Dwell time quantifies the percentage of time a respondent has spent looking at a certain area of interest. The specification of areas of interest makes it possible to quantify the dwell time of participants in these attributes (Drexler et al., 2017). The time to first fixation (TTFF) is the amount of time it takes for a respondent to look at a certain area of interest for the first time. These metrics are commonly used in eye-tracking research to measure visual attention paid to stimuli. These are measured as independent constructs, which say something about visual attention.

After completion of the experiment participants were asked to fill in the additional survey. This survey included statements on the purchase intention of eco-labelled products and trust in eco-labels. Besides participants were asked to fill in their gender, age and some statements on knowledge on eco-labels, as these attributes are controlled for in the analysis. The participants were asked to indicate

whether they agreed of disagreed with 21 statements on purchase intention, trust, and knowledge regarding eco-labels. A seven-point Likert scale was used to answer, including options ranging from 'strongly disagree' to 'strongly agree'. The purchase intention of eco-labelled products is measured with five items based on the study of Chang & Chen (2008). The construct of eco-label trust is measured with eight items based on the items used by Taufique et al. (2016) and Gorton et al. (2021). Four of the items are focused on the trust consumers have in eco-labels itself and the other four items are focused on the trust consumers have in the organisations behind the label. Combining these aspects of label trust is aimed at providing a clear overview of the general concept of eco-label trust. The control variable knowledge on eco-labels is measured with eight items from the studies of Taufique et al. (2016) and Kumar et al. (2021) that were incorporated in the questionnaire. The survey can be found in Appendix B.

3.3 Control variables

A total of three variables are statistically controlled for, as they might influence the outcomes. These are 'gender' and 'age' (participants characteristics), and 'knowledge on eco-labels' (reflective construct). Regarding gender, Brough et al. (2016) state that women's likelihood to embrace sustainable behaviors more readily than men can be partially explained by an association between green behavior and femininity that threatens the gender identity of men. In the field of eco-labelling, gender gives an independent contribution to predicting who had started the adoption process: women being more likely than men to have noticed the new label and know what it means (Thøgersen et al., 2010). Looking at age, the literature on the role of age in relation to sustainable consumption and the importance of eco-labels is not consistent. Some studies state that age does have an impact (e.g. Brazil & Caulfield, 2020; Stanes et al., 2015), other studies do not report a significant impact (e.g. Bulut et al., 2017). In respect of knowledge on eco-labels, several authors have contributed to literature by studying the effects of environmental knowledge in general on pro-environmental behaviour and stating that knowledge has a positive influence on this behaviour (e.g. Dhir et al., 2021; Khan et al., 2020; Polonsky et al., 2012). Taufique et al. (2016) looked further into this phenomenon regarding eco-labels and confirmed that in addition to general environmental knowledge, the knowledge of eco-labels also positively influences pro-environmental consumer behaviour. In conclusion, it can be derived from previous research that gender, age and knowledge on eco-labels could influence the outcomes of this study as they relate to the concepts used. Therefore, they are incorporated in this study as control variables.

3.4 Participants

The experiment took place at the faculty of management at a research university in the Netherlands. Passers-by, mostly students and university staff, were asked to participate in this experiment. In recruiting participants young participants with open, dark eyes were prioritized and people with downward eyelashes, soft contact lenses and glasses were avoided, as advised by Holmqvist &

Andersson (2017). The reflection in glasses can cover (parts of) the pupil and make tracking complicated, the same goes for contact lenses that have small air bubbles underneath (Holmqvist & Andersson, 2017). If participants wear mascara with downward eyelashes the software can confuse this dark area with the pupil, resulting in low quality data. For participants with upward eye-lashes mascara does not pose any problems (Holmqvist & Andersson, 2017). Participants were informed that the experiment was on consumption choices, to prevent intentional attention to the eco-label. The eco-label was not mentioned, which makes the transparency of the research goal lower than preferred. However, total transparency could have had detrimental effects on the results. Therefore, the main topic, which is the visual attention paid to the ecolabel, was not mentioned upon entry. The experiment and the survey were both conducted online on a laptop. At least 60 useful responses were needed for these research design, 30 participants in the test group and 30 participants in the control group. This minimum is based on the Central Limit Theorem (Kwak & Kim, 2017). A total of 62 respondents participated in the experiment and filled in the survey. However, the results of 2 respondents were excluded from the analysis due to missing values. The final sample consisted of 60 respondents. 60 percent of the respondents identified as female, and 40 percent of the respondents identified as male. The average age of final sample was 23 years old.

3.5 Research ethics

Out of ethical decency a consent form was filled in by the participants before starting, in which they acknowledged and approved their eye-movements being tracked by the webcam (Appendix E). The form also included approval for analysing the data anonymously and the possibility to quit the study at any time. Furthermore, the participants could leave their email address behind if they were interested in receiving the results after the study. The physical consent forms were collected in a random order to make sure eye-tracking and survey data could not be matched to a specific person based on the sequence. After sharing the results, the e-mail addresses were deleted from the laptop of the researcher and the consent forms were thrown away in a paper bin for confidential documents. Lastly, this work does not contain any form of plagiarism and the results are accurately presented in chapter 4.

3.6 Pre-test and pilot study

Before the actual data collection, a pre-test and a pilot study were conducted. The aim of the pre-test was to find out whether the manipulation of the eco-label placement to improve saliency was successful. The pilot study was conducted to test the eye-tracking software and check the comprehensibility of the statements in the survey. The sections below provide details on these studies and their results.

3.6.1 Pre-test

A total of 22 respondents (M_{age} = 24; 10 females) did the pre-test. The participants were randomly assigned to either the control group or the test group. The control group looked at the control stimulus

(original product packaging) and the test group looked at the manipulated stimulus (product packaging with the eco-label close to the brand name). Afterwards they expressed whether they agreed of disagreed with statements on the saliency and the attractiveness of the eco-label. These were measured with a 7-point Likert scale ranging from 'strongly disagree' to 'strongly agree'. The 4 items used to measure saliency were: the eco-label stands-out on the product packaging; I noticed the eco-label right away; the eco-label immediately grabbed my attention; and the eco-label is distinctive on the product packaging. The 5 items used to measure label attractiveness were: the eco-label looks appealing; I like the design of the eco-label; the eco-label looks attractive; the eco-label looks unique; and the eco-label looks stylish.

Independent-samples *t*-tests were conducted to find out whether participants who were exposed to the control stimulus and the participants who were exposed to the test stimulus, significantly differ regarding label saliency and label attractiveness. For each item the mean difference, t-score and significance level were analysed. The results, which can be found in Table I, showed that 2 item ratings of label saliency did significantly differ between the two groups (MD from 1.455 to 1.909; *t* from 2.390 to 3.266; *Sig* from .021 to .315). The results in Table II showed no significant differences between the test group and control group regarding perceived label attractiveness (MD from .000 to .500; *t* from .000 to .545; *Sig* from .137 to .799). No statistical difference has been found for the items measuring perceived label attractiveness, so participants in the test group do not perceive the attractiveness very different from participants in the control group. Therefore, the manipulation appears to be successful as saliency differs between the control group and the test group. Label attractiveness is perceived the same for both groups and is therefore not expected to cause differences in the actual study.

Table I Independent samples t-test perceived label saliency

Item	`Mean difference	t	Sig.
1.The eco-label stands out on the product packaging	1.727	2.390	.036
2.I noticed the eco-label immediately	1.909	2.863	.021
3.The eco-label immediately grabbed my attention	1.455	3.266	.315
4.The eco-label is distinctive on the product packaging	1.545	2.540	.260

Table II Independent samples t-test perceived label attractiveness

Item	`Mean difference	t	Sig.
1.The eco-label looks appealing	**-.091**	**-.291**	**.137**
2.I like the design of the eco-label	.128	.439	.330
3.The eco-label looks attractive	.000	.000	.274
4.The eco-label looks unique	-.333	-.182	.799
5.The eco-label looks stylish	.500	.545	.773

3.6.2 Pilot study

A total of 8 respondents participated in the pilot study, of which 4 in the first part of the pilot (M_{age} = 31; 1 female) and 4 in the second part of the pilot (M_{age} = 29, 3 females) . In the first part, the effectiveness of the manipulation was tested. The respondents were shown the control stimulus and the manipulated stimulus and were asked the following: “You get to see two images. I would like to ask you whether you would like to indicate per image whether you recognize an eco-label and where you think this eco-label is located on the product packaging. Please indicate on which image the distance to the brand name is smaller.” All respondents recognized the eco-label on the product packaging and described the differences in label placement. They also agreed that in the manipulated stimulus the eco-label was placed closer to the brand name. In the second part, the validity of the software and the comprehensibility of all parts of the experiment were tested. Gazerecorder was used for the eye-tracking part and respondents were asked the following: “You will see an image. I would like to ask you to focus your visual attention all the time on the eco-label (Rainforest Alliance).” The heat maps and numerical results of the software validity test can be found in Appendix C. These measurements indicate that the software can register a clear difference between the attention for the label at the bottom left and the attention for the label with the brand name. My expectation was a higher dwell time (fixation), because there was a specific request to continuously draw attention to the label. In all cases some fixation is registered below the label. For this reason, an area of interest was chosen in the definitive experiment that includes the product packaging slightly below the label. The area of interest was largened with 25% on the lower end, as in the pilot study all cased show high levels of fixation in this area. In three cases it was even more than 25% of the logo with fixation below that original area of interest. However, in the control group this might be due to another product element, namely the number of tea bags the product contains. Looking at the comprehensibility of the elements in the research process flow, the respondents indicated that they found the consent form, the instructions, and the survey questions completely understandable. When performing the first pre-test, it was noticed that age and gender were not yet included in the survey. This was added on site. Furthermore, one of the respondents indicated that one of the 'blocks' of statements in the survey did not open automatically, while the other blocks did. This did result in confusion, but the inconsistency has been resolved.

4. Results

The conducted analysis is partial least squares structural equation modelling, which is often referred to with PLS-SEM. This method combines a principal components analysis and ordinary least squares regressions (Mateos-Aparicio, 2011). Hair et al. (2012) state that PLS-SEM is particularly useful in studies with small sample sizes, as model parameters are estimated in blocks and multivariate normality is not required. Furthermore, it allows all relationships between variables and constructs to be estimated simultaneously (Hair et al., 2010). The software package was SmartPLS 3, and the bootstrapping

procedure used 10,000 subsamples. According to Hair et al. (2016), this number of subsamples generates solid standard errors and t-statistics (Hair et al., 2016). Eco-label placement was incorporated in the model as a dummy-variables, with the categories 'test group' and 'control group'. The category 'test group' was part of the model and the category 'control group' was used as the reference category.

Constructs and measurement model

First, theoretical definitions of the constructs involved are provided, as these provide the basis for selecting individual indicator items (Hair et al., 2010). The definitions of the latent constructs and the reflecting items and scale types can be found in Appendix D. As visual attention is measured with two items that are very different, Dwell Time and Time to First Fixation are incorporated as separate parallel constructs in the model, instead of a reflective visual attention construct.

Evaluation of measurement model

Preceding the evaluation of the measurement model, the item Know_5 has been transformed with a power transformation, as data had a high level of negative skewness and a high kurtosis. The effect of the data transformation can be found in Table 3 of Appendix F. Then, the internal reliability, convergent validity and discriminant validity of the measurement model were addressed (Hair et al., 2016). Regarding internal reliability, the composite reliability values for all multi-item constructs ranged from 0.85 to 0.93 (Table 4). These are all exceeding the recommended value of 0.70, as pointed out by Hair et al. (2011). Second, convergent validity was established (Table 4) by omitting five items (sequentially: Know_8, POWER_Know5; Know_7; Know_6 and Know_1). After deletion of these items, due to their low outer loadings, all average variance extracted (AVE) values exceeded 0.50 (Fornell and Larcker, 1981). Third, discriminant validity was assessed by looking at the Fornell-Lacker criteria: the square root of the AVE needs to exceed the inter-construct correlations (Fornell and Larcker, 1981). This is the case for the values of this study (Table 5, Appendix F). The Heterotrait-Monotrait measures, as can be found in Table 6, Appendix F, range from 0.095 to 0.524. As these are all below 1, this confirms the discriminant validity (Henseler et al., 2015).

Table 4 Factor loadings, composite reliability and average variance extracted of the constructs and their items

Components and manifest variables	Loading (*t*-value)
Purchase intention	*CR: 0.933, AVE: 0.737*
I consider switching to other brands for ecological reasons	0.857 (20.407)*
I intend to purchase certain products because of their environmental concern	0.884 (24.065)*
I consider buying green products because they contribute to less pollution	0.903 (23.772)*
I expect to purchase eco-labelled products in the future because of its environmental performance	0.809 (11.250)*
Overall, I am glad to purchase eco-labelled products because of their environmental friendliness	0.836 (12.195)*
Trust	*CR: 0.927, AVE: 0.617*
Eco-labels are genuinely committed to environmental protection	0.600 (2.738)*
Most of what eco-labels say about its products is true	0.831 (4.776)*
If the eco-label makes a claim or promise about its product, it's probably true	0.884 (5.756)*
Eco-labels are trustworthy	0.870 (6.124)*
Eco-label institutions are genuinely committed to environmental protection	0.737 (4.810)*
I feel assured that eco-label institutions do a good job making rules that protect people	0.736 (4.423)*
I feel assured that eco-label institutions do a good job making rules that protect the planet	0.712 (3.893)*
Eco-label institutions are trustworthy	0.870 (5,787)*
Knowledge	*CR: 0.850, AVE: 0.660*
I can explain to other people the meaning of eco-labels	0.626 (2.751)*
Using eco-labelled products is part of my daily consumption habits	0.925 (5.443)*
I can differentiate several eco-labels	0.824 (5.136)*

Notes: CR: Composite reliability; AVE: average variance extracted; *= p <.01,

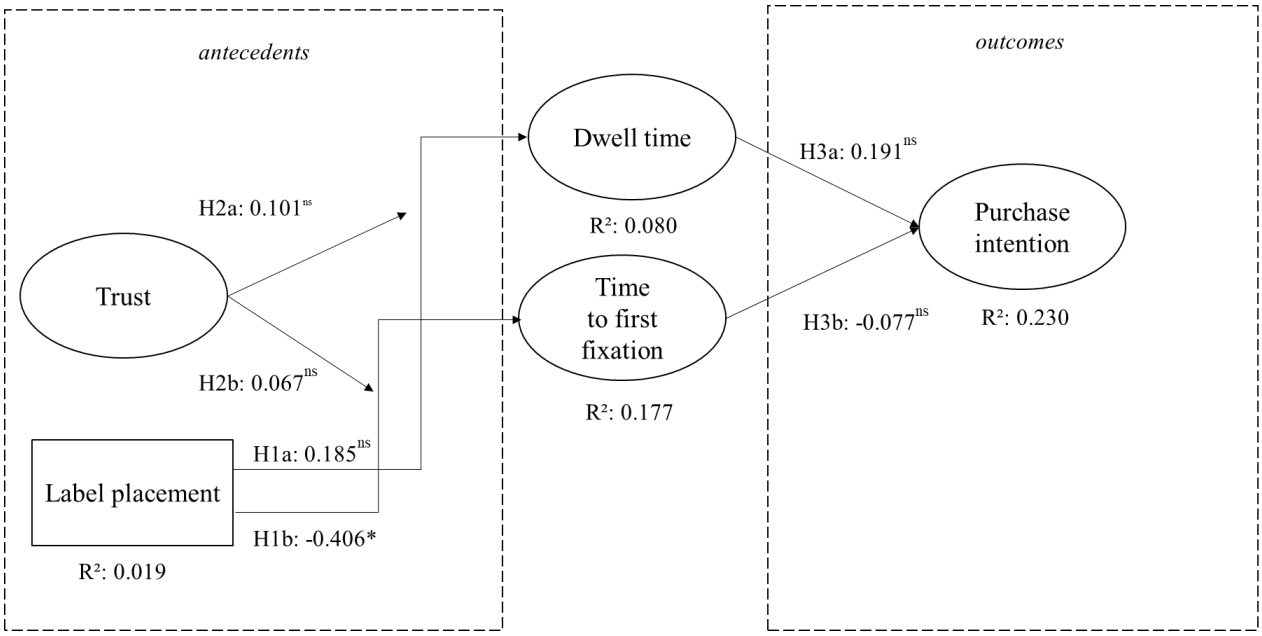
Evaluation of structural model

Preceding the evaluation of the structural model and the hypothesized paths, the model-fit was evaluated. The R2 values for each inner latent construct range between 0.019 and 0.230 (Figure 3), which can be categorized as small to medium values (Chin, 1998). Henseler et al. (2014) introduce the SRMR as a goodness of fit measure for PLS-SEM that can be used to avoid model misspecification. The SRMR is defined as the difference between the observed correlation and the model implied correlation matrix (Henseler et al., 2014). A value less than 0.10 (Hair et al.) are considered a good fit The estimated SRMR is 0.102. This exceeds the aforementioned cut-off point, but is really close. Therefore, I also used the GOF-index of Tenenhaus et al. (2005) to confirm an acceptable model-fit, in which As SmartPLS does not $GoF = \sqrt{\overline{communality} \times \overline{R}^2}.$ provide communalities, the average squared outer loadings are used in the calculation. The GoF value is 0.29, which indicates adequate fit by exceeding the minimum value for medium R2-values of 0.25 (Wetzels et al., 2009).

As aforementioned, visual attention is measured with two parallel constructs: dwell time (DT) and time to first fixation (TTFF). For each hypothesis part a refers to visual attention measured with dwell time and part b refers to visual attention measured with the time to first fixation, as can be seen in Figure 3. First, the structural model results indicate that there is no statistical significance for H1a (β = 0.185; $p > 0.05$; $R^2 = 0.080$). However, H1b shows a significant effect of strategic label placement on the time to first fxation for both, $p < 0.05$ and $p < 0.01$ (β =- 0.406; $R^2 = 0.177$). H2a and H2b were

tested to see whether there is a moderating effect of trust in eco-labels on the visual attention paid to eco-labels. For both measures, dwell time ($\beta = 0.101$; $p > 0.05$; $R^2 = 0.080$) and time to first fixation ($\beta = 0.067$; $p > 0.05$; $R^2 = 0.177$), no statistical evidence was found for these hypotheses. Additionally, the direct effect of trust on visual attention was measured. However, no support for a significant effect of trust on dwell time ($\beta = 0.151$; $p > 0.05$; $R^2 = 0.080$) and time to first fixation ($\beta = -0.056$; $p > 0.05$; $R^2 = 0.177$) was found. Lastly, H3a and H3b are concerned with the effect of visual attention on purchase intention. The purchase intention for eco-labelled products cannot be explained by the visual attention paid to eco-labels for all participants looking at both, dwell time ($\beta = 0.191$; $p > 0.05$; $R^2 = 0.230$) and the time to first fixation ($\beta = -0.077$; $p > 0.05$; $R^2 = 0.230$). The beta coefficients, standard deviation, t-statistics and p-values of all relations in the structural model can be found in table 7 in Appendix F. No alternative explanation was found in the control variables, as the structural model indicates the following values for knowledge on eco-labels ($\beta = 0.263$; $p > 0.05$; $R^2 = 0.230$), gender ($\beta = 0.103$; $p > 0.05$; $R^2 = 0.230$) and age ($\beta = 0.155$; $p > 0.05$; $R^2 = 0.230$).

Figure 3: Structural model results



Notes: *: meets or exceeds $p < 0.01$ (two-tailed); ns: non-significant

5. Discussion

5.1 Key contributions

The aim of the research was to investigate the effect of eco-label placement and trust on visual attention paid to eco-labels and its relation to purchase intention of eco-labelled products. The key contributions of this study are (1) evidence of the proposed effect of strategic label placement on visual attention paid to eco-labels looking specifically at consumers' time to first fixation that does not hold for dwell time, (2) disproving the expected moderating role of trust in eco-labels on the relation between label placement and visual attention paid to eco-labels, and (3) the absence of a significant effect of visual attention paid to eco-labels as a driver of purchase intention for eco-labelled products.

The results of this study contribute to the debate on eco-label effectiveness, knowledge on the placement effects of this type of label, and insight in the moderating impact of a top-down factor on the effectiveness of a bottom-up factor in its relation to visual attention. First, it appears that it depends on the measure of visual attention whether eco-label placement drives consumers' visual attention towards eco-labels. Looking at dwell time, no evidence was found that consumers fixate more on the eco-label when it is placed closer to the brand name compared to the original placement on the bottom-left of the product packaging. However, eco-label placement does affect the time to first fixation. Placement of the eco-label close to the brand name results in a lower time to first fixation compared to the eco-label placement on the product packaging that was not manipulated. Even tough the effect of label placement on visual attention is not significant, the test group looking at the manipulated stimulus with strategic label placement has a higher dwell time for the eco-label compared to the control group. Which is in line with the expectations on the effect of the eco-label placement manipulation. Second, no support was found for a moderating role of trust. This indicates that trust in eco-labels does not change the strength of the relationship between strategic eco-label placement on visual attention paid to eco-labels. This holds for both measures: dwell time and time to first fixation. Third, the results do not provide support for the hypothesis that the visual attention paid to eco-labels is a driver of purchase intention for eco-labelled products. For both measures of visual attention, dwell time and time to first fixation no significant effect was found for purchase intention for eco-labelled products. From these results it could not be concluded that consumers' visual attention towards eco-labels translates to purchase intention for eco-labelled products. Therefore, the third hypothesis is rejected.

Theoretical implications and contributions

Key finding 1: evidence of the proposed effect of strategic label placement on visual attention paid to eco-labels looking specifically at consumers' time to first fixation that does not hold for dwell time,

A few eye-tracking studies have been conducted on the role of label placement as a product packaging stimulus on visual attention. However, these were focused on either warning labels or nutrition labels. For the first time, the effect of strategic placement on visual attention is researched in an eco-label context. Therefore, this study conveys previous research on label placement and visual attention to the context of eco-labelling and sustainable consumption. It partly answers a suggestion of Orquin and Mueller-Loose (2013) that the first fixation itself does not influence preference for an item but that fixations driven by visual salience might influence choice by gate-keeping the alternatives that enter the consideration set. This study found evidence that visual saliency in terms of label placement indeed drives the time to first fixation. More specifically, the first key finding adds that there is a positive effect of strategic label placement on visual attention paid to eco-labels looking specifically at consumers' time to first fixation. Researchers in the field of marketing and sustainable consumption could use key finding 1 as a starting point for studies on time to first fixation as a measure of visual attention in effective communication of sustainability claims via eco-labels. Also, identifying whether the effect of strategic placement on the time to first fixation holds in the context or warning labels could be a useful addition to the studies of Hilton (1993) and Halim (2019), as for these labels there is a high importance for consumers' immediately noticing the information.

The positive effect of strategic label placement on visual attention does not hold for dwell time as a measure. It was unexpected that salient placement of the eco-label near the brand name (and the center) does not have a significant effect on the dwell time for this product element. This may be due to the distraction from competing information on the product packages and the short time consumers spent on product evaluation (Song et al., 2019). Another possible explanation for the effect on the time to first fixation and the lack of effect on the dwell time is that an organic logo is easy to recognize, but not always completely understood (de Boer et al., 2006). Also, the significant effect of a more salient placement of the label near the brand name on the time to first fixation, might have an alternative explanation. The brand name was the central product element on the packaging, placement of the label near the brand name also meant placement more in the center of the product packaging. Orquin et al. (2019) highlighted the importance of label placement to the center of product packaging for the probability of consumers fixating on a product packaging element.

Key finding 2: disproving the expected moderating role of trust in eco-labels on the relation between label placement and visual attention paid to eco-labels.

Many studies on eco-labels are either focused mainly on bottom-up factors (e.g. Rihn et al., 2019; Vlaemink et al., 2014) or top-down factors (e.g. Grankvist et al., 2004; Ratner et al., 2021). Only a few have combined both (e.g. Song et al. 2019; Suki, 2013). However, these studies have not looked at the top-down factor 'trust' as a possible moderator. This study further explored combining top-down and bottom-up variables in eco-label research, by incorporating trust in eco-labels in the study as a possible moderator on the effect of strategic label placement on visual attention. No significant moderating effect was found for both, the effect of placement on the time to first fixation and the effect of placement on the dwell time. This was not expected, as neurological studies have shown that bottom-up stimuli are able to directly impact attention, while top-down factors often moderate such influence (Melloni et al., 2011; Sawaki & Katayama, 2008). Additionally, the results showed no significant direct effect of trust on visual attention. So, in this specific combination of eco-label placement and visual attention, trust is not strengthening the effect of the bottom-up factor.

However, as trust is often highlighted as an important top-down factor in sustainable consumption (Oates at al., 2008; Taufique et al., 2019), the role of trust should not be underestimated. Since the processing of sensorial information and paying visual attention to specific elements is very complex, more research is needed to gain more understanding. According to Mittal et al. (2020), the optimal combination of bottom-up and top-down information remains an open question and the manner of combination must be dynamic and both context and task dependent. Therefore, findings on the neurological processes of visual attention should be further investigated in studies looking at different combinations of top-down and bottom-up variables in specific contexts. These insights contribute to being able to steer visual attention by providing certain cues. In the context of sustainability, it contributes to identifying the optimal way of communicating sustainability efforts.

Key finding 3

Many authors have shown that in general more visual attention to a product concept alternative and the attributes of a product concept alternative lead to a higher likelihood of the alternative to be chosen, more specifically visual attention plays an active part in decision making and purchase likelihood (Khachatryan et al. 2017; Meyerding & Merz, 2018; van Loo et al., 2021). In the context of eco-labelling, there is debate on the effectiveness of eco-labels as a means of sustainable consumption. Key finding 3 enlightens the contradicting findings by identifying the role of visual attention paid to eco-labels, measured by both dwell time and time to first fixation, on the purchase intention for eco-labelled products. Göcer and Oflac (2016) expected a positive relation between visual attention and the purchase intention of these products, as knowledge provided by eco-labels, increases consumers' levels of awareness and attracting their attention, which can ultimately trigger green consumerism.

The results of this study do not confirm the expectation Göcer and Oflac (2016), as no significant effect has been found for both measures of visual attention. This might be due to other top-down and bottom-up factors influencing consumers' purchase intention of eco-labelled products, which is in line with Drexler et al. (2017) who stated that visual attention towards eco-labels does not guarantee increased sales as 50% of consumers buy these products only in exceptional cases and Song et al. (2019) stating that consumers care more about other product attributes such as price, product appearance, and nutrition tables. The study contributes to the ongoing debate on the effectiveness of ecolabels, by using eye-tracking and finding no evidence for visual attention paid to eco-labels to be a driver of purchase intention of eco-labelled products. The labels could be useful in distinguishing green products, but their effectiveness in driving consumers' purchase intentions for eco-labelled products might be overestimated.

Managerial implications

By identifying the role of eco-label placement on the visual attention and purchase intention of eco-labelled products, this study provides new insights to improve eco-label effectiveness and communication of sustainability efforts. This could help gain a better understanding of the customer experience and changing buying behaviour. It is aimed at steering consumer purchase decisions towards more sustainable products, which contributes to reducing the need for scarce natural resources and meeting the sustainable development goals, as well as improving the competitive position of the selling firm. Two stakeholder groups have been identified for whom the aforementioned key findings have practical implications: (a) marketeers who aim to promote sustainability efforts of a brand by using eco-labels on product package design, and (b) policy makers in the field of sustainable consumption and eco-labelling.

Marketeers

Getting and maintaining attention still is one of the biggest challenges for marketeers (Weima, 2019). Key finding 1 provides a contribution to this main challenge. If marketeers want an eco-label to be noticed quicker, evidence has been found for salient placement as an effective strategy. This does not work for enlarging the total amount of consumers' fixation on the eco-label. Lowering the time to first fixation by strategically placing the eco-label close to the brand name on the product packaging, could make it easier for consumers to distinguish eco-labelled products quicker. Even though no evidence was found for trust as a moderator on the relation between placement and visual attention, marketeers should pay attention to gaining consumer trust in their sustainability efforts. Other studies have showed that consumers utilize sustainability claims in decision-making only if they trust the message conveyed (Oates at al., 2008; Taufique et al., 2019). Consumers are becoming very discerning and losing trust in corporations in general as many firms profess to protect the environment but fail to demonstrate that in their actions and performance (Nyilasy et al., 2013). Even the consumers themselves indicate that

trusting a brand is now more important than it has been in the past (Edelman Trust Barometer, 2020). Eco-labels provide a solution in attaining consumer trust due to the third-party certification; but for managers wishing to increase consumer uptake of their labels, communicating this third-party verification is a critically important informational cue for enhancing consumer trust (Gorton et al., 2021). Despite that no evidence was found for visual attention driving purchase intention, quickly noticing eco-labels could contribute to more recognition and consumer learning (Nilsson et al., 1999). This implicates for marketeers that they could focus more on other proven drivers of purchase intention for eco-labelled products, such as quality and price (D'Souza et al., 2007).

Policy makers

Environmental policy objectives, such as the sustainable development goals, are highly important. Our natural resources are scare, and the world population and our standards of living are increasing. In order to achieve these objectives, it is important that consumers notice, understand and trust information provided to enhance sustainable consumption. Key finding 1 indicates that steering visual attention to eco-labels via salient placement is effective for the time to first fixation. This could be very useful for policy makers aiming to enhance consumers' self-efficacy regarding sustainability. It is likely that consumer belief in the environmental significance of responsible purchase behaviour is strengthened by a strong prevalence of eco-labels because it makes it more credible that consumers can make a difference by choosing such products (Thøgersen, 2000; Testa at al., 2015). Even though this study did not found evidence for a moderating effect of trust, this top-down factor remains important for purchase intention of sustainable products. Policy makers could think of ways to communicate to consumers that third-party verified eco-labels are actually useful and trustworthy. As consumers are becoming very discerning and losing trust in corporations, information from policy makers on which eco-claims are trustworthy, for example via a national campaign with commercials and billboards, can be critical. Furthermore, it is clear from the debate on the effectiveness on eco-labels that the full potential of eco-labels has not been reached. The results of this study contribute to this debate that no evidence was found for visual attention paid to eco-labels as a driver of purchase intention for eco-labelled products. Eco-label usage can truly add value in processing sustainability claims on product packaging. But, to actually promote green buying behaviour, consumers need more guidance to understand why green consumerism is necessary and contribute to sustainable development goal 12. This is in line with Meis-Harris et el. (2021), who indicate that eco-labels on their own are an information-based communication tool that is unlikely to create significant shifts in consumer choices or production. The European Commission has written a strategic eco-label workplan for specifically the EU-ecolabel, which has specific and achievable actions on a timetable. To reach the overarching goal: empower market actors to consume, produce and live more sustainably and engage them in the transition towards a circular economy, policy makers should execute these actions not only for the EU-ecolabel but for all third-party verified eco-labels.

5.2 Limitations and future research

Although useful insights are presented in this study, it also has some limitations that should be discussed.

First, this study measured purchase intention as a predictor of actual purchase behaviour. Literature has shown that purchase intention can be used as a reliable predictor. However, in the context of green consumerism it could have resulted in higher purchase intentions than the respondents would have in an actual buying situation, due to the intention-actual behaviour gap. Further research could identify whether purchase intention is still a reliable predictor when applied to studies on green buying behaviour.

Second, this study manipulated eco-label placement by placing it near the brand name to be more salient, but this was also more to the center of the packaging. It is unclear whether the effect of salient placement is a result of the eco-label being positioned close to the brand name or more to the center or a combination of both. Additional research could further investigate the effect of eco-label placement on visual attention by studying multiple different manipulations focusing on position and closeness to other product elements. No evidence was found for an effect of visual attention paid to eco-labels and the intention to buy eco-labelled products. Further research should focus on discovering more effective ways to steer consumers' purchase decisions towards eco-labelled products. For example, a pre-test post-test experiment could identify whether eco-label effectiveness improves due to increased recognition, knowledge and trust. Qualitative research with focus groups might deepen the knowledge on the customer experience regarding eco-labels, in order to give policy makers more concrete advice on the role of eco-labels in promoting green buying behaviour. Also, additional research could identify whether eco-labels that are strategically placed and provide more textual information gain more visual attention, in terms of time to first fixation and dwell time.

Third, eye-tracking is a valuable research method, which unfortunately has some flaws. Free-trial licenses of Gazerecorder were used, which only allowed 5 respondents for each account. As the areas of interest needed to be drawn by hand on the visual stimuli these could differ slightly between the different accounts. A ruler was used to minimize these differences. Also, as the experiments were conducted throughout multiple days lightning might have differed a bit among the experiments. As the eye tracking software uses light reflections on the eyes to gather information on eye-movements and directions, this might have resulted in minor differences in accuracy.

Fourth, the area of interest in Gazerecorder was largened with 25% on the lower end, as in the pilot study all cased show high levels of fixation in this area. In three cases it was even more than 25% of the logo with fixation below that original area of interest. However, in the control group this might be due to another product element, namely the number of tea bags the product contains. It could be that for this specific webcam and the Gazerecorder accuracy the measured visual attention should have required an area of interest which was even more largened on the lower end.

Lastly, due to the scope of the master thesis only 60 participants were part of the experiment. A higher number of participants could have led to more accurate results. Also, mainly Radboud University students participated in the study, which lowers the generalizability of the results. As this university focuses a lot on sustainability and actively involve students by stating that they have a part to play, this could have influenced the results of both, the pre-test and actual study.

5.3 Conclusion

Eco-labels have been introduced as a means to drive a widespread transition towards more sustainable lifestyles. However, there is debate on the effectiveness of eco-labels on sustainable purchase behaviour and unclarity about role of visual attention and its antecedents. The findings of this study indicate that strategic label placement has a positive effect on visual attention when it is measured with the time to first fixation not for dwell time. Moreover, it disproves the expected moderating role of trust in eco-labels on the relation between label placement and visual attention paid to eco-labels, and effect of visual attention paid to eco-labels as a driver of purchase intention for eco-labelled products. The insights could be used to improve communication of sustainable claims via eco-labels. However, eco-labels on their own are an information-based communication tool that is unlikely to create significant shifts in consumer choices or production unless it is supplemented by a strategic eco-label workplan. A deeper understanding of the role of visual attention and the complex interplay of top-down factors and bottom-up factors could strengthen the foundation for such a strategic workplan.

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Appendices

A. Visual Stimuli

Picture 1 Visual stimulus test group

Picture 2 Visual stimulus control group

B. Survey

Below you find a number of statements on purchase intention with which some people agree and others disagree. Please rate how much you personally agree or disagree with these statements-how much they reflect how you feel or think personally.

	Stongly disagree	Disagree	Somewhat disagree	Neutral	Somewhat agree	Agree	Strongly agree
I consider switching to other brands for ecological reasons	○	○	○	○	○	○	○
I intend to purchase certain products because of their environmental concern.	○	○	○	○	○	○	○
I consider buying eco-labelled products because they contribute to less pollution.	○	○	○	○	○	○	○
I expect to purchase eco-labelled products in the future because of their environmental performance	○	○	○	○	○	○	○
Overall, I am glad to purchase eco-labelled products because of their environmental friendliness.	○	○	○	○	○	○	○

Below you find a number of statements on trust with which some people agree and others disagree. Please rate how much you personally agree or disagree with these statements-how much they reflect how you feel or think personally.

	Stongly disagree	Disagree	Somewhat disagree	Neutral	Somewhat agree	Agree	Strongly agree
Eco-labels are genuinely committed to environmental protection.	○	○	○	○	○	○	○
Most of what eco-labels say about its products is true.	○	○	○	○	○	○	○
If the eco-label makes a claim or promise about its product, it's probably true.	○	○	○	○	○	○	○
Eco-labels are trustworthy.	○	○	○	○	○	○	○
Eco-label institutions are genuinely committed to environmental protection	○	○	○	○	○	○	○
I feel assured that eco-label institutions do a good job making rules that protect people.	○	○	○	○	○	○	○
I feel assured that eco-label institutions do a good job making rules that protect the planet.	○	○	○	○	○	○	○
Eco-label institutions are trustworthy	○	○	○	○	○	○	○

Below you find a number of statements on eco-labels with which some people agree and others disagree. Please rate how much you personally agree or disagree with these statements-how much they reflect how you feel or think personally.

	Stongly disagree	Disagree	Somewhat disagree	Neutral	Somewhat agree	Agree	Strongly agree
I can explain to other people the environmental features of products.	○	○	○	○	○	○	○
I can explain to other people the meaning of eco-labels.	○	○	○	○	○	○	○
Using eco-labelled products is part of my daily consumption habits.	○	○	○	○	○	○	○
I can differentiate several eco-labels	○	○	○	○	○	○	○
I know the meaning of the term “recycled.”	○	○	○	○	○	○	○
I know the meaning of the term “eco-friendly.”	○	○	○	○	○	○	○
I know the meaning of the term “organic.”	○	○	○	○	○	○	○
I know the meaning of the term “energy-efficient.”	○	○	○	○	○	○	○

Q5

Gender

- ○ Male
- ○ Female
- ○ Non-binary

Q6

Age

C. Eye-tracking data pilot study

Respondent 1 (test group):

- Dwell time: 57%
- TTFF: 0.89s

Respondent 2 (test group):

- Dwell time: 62%
- TTFF: 0.59s

Respondent 3 (control group):

- Dwell time: 53%
- TTFF: 0.53s

Respondent 4 (control group):

- Dwell time: 62%
- TTFF: 0.85

D. Latent constructs defined

Latent constructs	Definition	Item	Scale type
Visual Attention	The allocation of an individual's processing capacities to stimuli in their visual field (Bundesen, Habekost, & Kyllingsbaek, 2005)	Dwell time (=The time that a participant focuses on a particular point; Drexler et al., 2017). Measured as the percentage of time a respondent has spent looking at a certain area of interest.	Ratio
		Time to first fixation (=TTFF; the amount of time it takes for a respondent to look at a certain area of interest for the first time). Measured in seconds.	Ratio
Purchase intention of eco-labelled products	The degree to which a consumer is willing to buy an eco-labelled product.	I consider switching to other brands for ecological reasons (PI_1)	Interval
		I intend to purchase certain products because of their environmental concern (PI_2)	Interval
		I consider buying green products because they contribute to less pollution (PI_3)	Interval
		I expect to purchase eco-labelled products in the future because of its environmental performance (PI_4)	Interval
		Overall, I am glad to purchase eco-labelled products because of their environmental friendliness (PI_5)	Interval
Trust in eco-labels	Trust in the label itself or trust in the organizations behind the label that set the standards for being able to use the labels in	Eco-labels are genuinely committed to environmental protection (Trust_1)	Interval

	promotions for products and services (Khachatryan et al., 2021)	Most of what eco-labels say about its products is true (Trust_2)	Interval
		If the eco-label makes a claim or promise about its product, it's probably true (Trust_3)	Interval
		Eco-labels are trustworthy (Trust_4)	Interval
		Eco-label institutions are genuinely committed to environmental protection (Trust_5)	Interval
		I feel assured that eco-label institutions do a good job making rules that protect people (Trust_6)	Interval
		I feel assured that eco-label institutions do a good job making rules that protect the planet (Trust_7)	Interval
		Eco-label institutions are trustworthy (Trust_8)	Interval
Eco-label knowledge (control variable)	Consumers' familiarity with the functional aspects of eco-labels and the meaning of different terms used in eco-labels (Taufique et al., 2016).	I can explain to other people the environmental features of products (Know_1)	Interval
		I can explain to other people the meaning of eco-labels (Know_2)	Interval
		Using eco-labelled products is part of my daily consumption habits (Know_3)	Interval
		I can differentiate several eco-labels (Know_4)	Interval
		I know the meaning of the term "recycled" (Know_5)	Interval
		I know the meaning of the term "eco-friendly" (Know_6)	Interval

		I know the meaning of the term “organic” (Know_7)	Interval
		I know the meaning of the term “energy-efficient” (Know_8)	Interval

E. Consent form

Purpose:
The purpose of this research study is to investigate the customer decision making process in shopping behaviour.

Equipment:
Gazerecorder eye-tracking software (via webcam)

Procedure:
As part of the study, you will be exposed to an eye-tracking experiment, after which you are asked to complete an online questionnaire. Please confirm the following. I understand that my eye-movements are being tracked and this data is saved in the form of heat maps and excel. Further, I confirm that I do not have any physical, mental or health-related reasons or problems that should preclude my participation in the eye-tracking experiment (e.g. a lot of mascara, cataract, cross-eyed).

If you agree to participate in this study, you will be asked to do the following:

1. Be immersed in a eye-tracking experiment for about 6 minutes using the eye-tracker software via the laptop. The eye-tracking equipment measures your physiological response in terms of pupil fixations and pupil dilation during the immersion.
2. Complete a short online questionnaire afterwards.

The total time required to complete the study should be approximately 15 minutes including briefing, set-up/calibration and debrief.

Health Notice/Risks:

The images you will be shown include regular supermarket products. We do not expect that exposure to these graphics will cause any harm or discomfort, however if you experience feelings of distress as a result of participation in this study you can let the researcher know and I will provide you with assistance.

Confidentiality:
Your participation in this study is entirely voluntary and you may refuse to complete the study at any point during the experiment or refuse to answer any questions with which you are uncomfortable. You may also stop at any time and ask the researcher any questions you may have. Your data will be treated strictly confidential and will be used for a research project, in which data of all participants will be collated. Information collected for this research project may be made available to other research projects in de-identified form only. Additionally, the information and results from this project may be submitted for publication in the Radboud Thesis repository, however this information will not identify you in any way.

Contact and Questions:
If you have any questions regarding this study, you may contact the researcher via eva.mientjes@ru.nl / 06-33002653

Statement of Consent:
I have read and understood the above information. I have asked any questions I had regarding the experimental procedure and they have been answered to my satisfaction. I consent to participate in this study.

Name of Participant_____ Date: _____

Signature of Participant _____

Thanks for your participation!

F. Output analysis

Table 3 Descriptives power transformation Know_5

Item	Mean	Median	Min	Max	Std. deviation
Know_5	5.850	6.000	2	7	0.997
POWER_Know5	35.217	36.000	4	49	10.208

Table 5 Correlations and square root of the AVE

Construct	1	2	3	4	5
1. Placement	**				
2. Trust	0.138	0.786			
3. DT	0.206	0.194	*		
5. TTFF	-0.414	-0.101	-0.524	*	
5. Purchase intention	0.111	0.236	0.345	-0.190	0.858

Notes: Values down the diagonal are the square roots of the AVE; all others are correlation coefficients; *single-item construct; **manipulation

Table 6 Heterotrait-Monotrait ratio

Construct	1	2	3	4	5
1. Placement	**				
2. Trust	0.124				
3. DT	0.206	0.164	*		
4. TTFF	0.414	0.095	0.524	*	
5. Purchase intention	0.160	0.221	0.362	0.202	

Notes: Values down the diagonal are the square roots of the AVE; all others are correlation coefficients; *single-item construct; **manipulation

Table 7 Path coefficients structural model

Relation	β-coefficient	Std. Deviation	T-statistics	P-values
DT > Purchase intention	0.191	0.146	1.312	0.189
TTFF > Purchase intention	-0.077	0.152	0.506	0.613
Placement > DT	0.185	0.127	1.460	0.144
Placement > TTFF	-0.406	0.118	3.447	0.001*
Moderation trust > Placement*DT	0.101	0.142	0.710	0.478
Moderation trust > Placement*TTFF	0.067	0.129	0.516	0.606
Trust > DT	0.151	0.179	0.845	0.398
Trust > TTFF	-0.056	0.151	0.373	0.709
Knowledge > Purchase intention	0.263	0.160	1.651	0.099
Gender > Purchase intention	0.103	0.121	0.857	0.391
Age > Purchase intention	0.155	0.083	1.858	0.063

*Significant effect