

The Impact of Altering Food Packaging Design on Evoking Consumer Perceptions and Sustainable Purchase Intention

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1. Abstract

The agri-food industry faces substantial challenges due to the negative consequences of unsustainable production and consumption, including resource depletion, climate change, and biodiversity loss. This study explores the effectiveness of sustainable packaging design in influencing consumer behaviour towards more sustainable consumption patterns. Despite the increasing awareness of sustainability issues, a significant intention-behaviour gap persists, wherein consumers' good intentions do not translate into sustainable purchasing actions. Through an empirical investigation, this research examines how manipulating design elements and using analogies on food packaging can evoke emotions and perceptions that stimulate purchase motivation. The findings indicate that while sustainability features on packaging can cue product perceptions, they often fail to stimulate purchase intention due to the psychological distance consumers perceive between sustainability and immediate functional goals. This study contributes to understanding sustainable consumption by highlighting the importance of reducing psychological distance through concrete and specific messaging to enhance sustainable products' credibility and personal relevance.

2. Introduction

The agri-food industry confronts significant challenges due to the increasing awareness of the negative consequences unsustainable production and consumption bring (FAO., 2022). The seeming success of mass production after the Green Revolution has accounted for fundamental social and environmental problems, including resource depletion, climate change, deforestation, severe biodiversity loss, and environmental degradation, as it uses up immoderate natural resources and emits excessive pollutants (Cherubini et al., 2023; Crippa et al., 2021; Ritchie & Roser, 2020). Overconsumption and uneven distribution of resources are also key issues that lead to problems such as health issues, food waste, hunger, poverty, and food insecurity (Horton, 2023; Pawlak & Kołodziejczak, 2020). These failures in our current food and farming system imply the urgent need for intentional, comprehensive, and systematic approaches to sustain the ongoing supply of goods and services from natural resources while meeting current needs without compromising future generations (El Bilali, 2019; Lim, 2017; Prothero et al., 2011).

In this sense, agri-food stakeholders have initiated proactive actions to transform the cost-and-benefit-based system into a more prosocial and pro-environmental practice. This ranges from top-down approaches regarding legislation, corporate social responsibility (CSR), and environmental, social, and governance (ESG) to bottom-up approaches, which require a multidimensional focus dedicated by smallholder farmers, local communities, education, and consumers (Sandhu, 2021). In 2020, the EU Commission presented the “Farm to Fork” strategy to steer the EU food system towards greater sustainability (Goodland & Ledec, 1987). The interplay of nutrition, environment, and society was prioritised as the three pillars of the agri-food system, with its concepts rooted in the theory of neoclassical economic principles on sustainable development (Fetting, 2020). Accordingly, state governments formulated relevant legislation to regulate and restrict food production, such as forbidding the use of pollutive and non-degradable materials (fossil-based plastic) and encouraging environmentally friendly production techniques (Serebrennikov et al., 2020; Trubetskaya et al., 2022). Food producers and retailers opt for alternative packaging materials, such as biobased plastic and biodegradable packaging material (Versino et al., 2023). Farmers encompass practices like improving animal welfare, organic farming, manure fertilisation, water, soil and biodiversity preservation (Gustafson et al., 2016; Horton, 2023; Serebrennikov et al., 2020). Consumers also play a central role in sustainable development through their purchase and consumption decisions, as the current production and supply system is demand-driven and market-oriented (Kohli & Jaworski, 1990). A sustainable agri-food system can only be sustained when the market demands sustainable products.

Although consumers show positive attitudes and desire towards pro-social and pro-environmental behaviours, the ultimate purchase decisions are often less sustainable than they intend to be, showing the discrepancy between what consumers say and do (Carrington et al., 2010; Hassan et al., 2016; Park & Lin, 2020; White et al., 2019). This is recognised as an intention-behaviour gap and is a significant challenge for policymakers, marketers, producers, and nonprofit organisations who aim to promote sustainable consumption, as it appears that additional boosters are urgently needed to bridge this gap between good intentions and poor behaviour.

Product packaging has been acknowledged as an effective medium to communicate product-related information, using implicit and explicit feature cues for consumers to interpret product attributes and form perceptions (Gil-Perez et al., 2020; Gil-Perez et al., 2019; Simmonds & Spence, 2017; Steenis et al., 2017). Therefore, manipulating design elements and using analogies on food packaging has been a common approach to evoke various emotions and perceptions, which hopefully would stimulate purchase motivation (Giannoutsos et al., 2023; Granato et al., 2022; Manta et al., 2021; Versino et al., 2023). However, sustainability features appear to have a

low and ineffective impact on stimulating the purchase intention (Miraballes et al., 2014; Romero & Biswas, 2016; Szocs & Lefebvre, 2016; Togawa et al., 2019; Van Trijp & Fischer, 2010). Consumers have shown to be unaware of ^[OBJ], mistrusted ^[OBJ], or uninterested in the benefits of sustainable products (McCarthy & Wang, 2022), indicating ineffective communication for sustainable products relevant to consumers' information processing and decision-making process (Grunert et al., 2010).

These sustainable features are effective in cueing product perception. Still, the mismatch between functional and sustainable food consumption goals hinders the motivation towards more sustainable behaviours. In conventional food consumption patterns, consumers focus on and seek products' functional, practical, or physical performance, referring to the quality attributes that could be experienced, such as taste, aroma, aesthetics, convenience in handling, cost-effectiveness, etc. This is recognised as the functional goals of food consumption, which prioritise and maximise the fulfilment of one's benefits (Sheth et al., 1991). However, sustainable consumption (SC) prompts consumers to consider further the credence values of benefitting others and the natural world, which refer to product attributes that cannot be ascertained even after purchase or consumption, such as labour and environmental friendliness (Ford et al., 1988; Lancaster, 1966; Lee & Hwang, 2016; Otto et al., 2021; White et al., 2019). When functional and sustainable goals mismatch or cannot both be fulfilled on a product, consumers are likely to compromise sustainable goals since functional goals are the primary drivers of food consumption (Sheth et al., 1991).

However, despite both goals being addressed and achieved, the intention-behaviour gap is likely to remain as consumers have preferred familiar and cost-effective options and are less willing to transit options when their benefits or costs are unclear. That is because people perceive sustainable and functional goals through different construal levels, which are determined by various dimensions of psychological distance in terms of temporal, spatial, social, and hypothetical nature (Trope & Liberman, 2010; Trope et al., 2007). Sustainability and its effects are generally described as psychologically distant in all dimensions, being an abstract topic far from here, now, and self (Fujita et al., 2013; Jaeger & Weber, 2020). On the other hand, functional goals are immediate, specific, and highly self-related, positioned in a relatively low-level construal (Jaeger & Weber, 2020). Therefore, even though consumers may show awareness and concern about sustainability when thinking at the level of abstraction, its importance becomes less relevant in decision-making when the limited feasibility of sustainable goals is compared with salient functional goals, triggering the inner competition to trade-off between self, social, and environmental benefits. In this sense, matching the construal levels of sustainable and functional food consumption goals has been suggested as a promising strategy to increase the approachability of credence values (Jaeger & Weber, 2020).

To effectively motivate individuals to consider sustainable values without compromising functional goals, it is imperative to include the three sustainable motives in product communication: biospheric, social-altruistic, and egoistic (Liao et al., 2020; Stern & Dietz, 1994). Biospheric emphasises the inherent value of the natural environment, with the mindset that all things in the ecosystem deserve moral consideration (de Groot & Steg, 2008; Stern & Dietz, 1994; Wesley Schultz & Zelezny, 1999). Social altruism is the selfless desire to benefit others rather than oneself, driven solely by empathy concerns (Batson, 2010). Egoism focuses on fulfilling one's welfare and self-interest, which implies egoists are less considerate of the impacts on others (Feinberg, 2007; Kareklas et al., 2014). However, how the three motives weigh for each individual to take sustainable actions differs depending on one's value structure: for consumers who are more self-transcendence oriented, products emphasising biospheric and social altruism might be effective to motivate them to purchase and consume more sustainably. In contrast, self-enhancement individuals tend to be more motivated when egoism is addressed (de Groot & Steg, 2008; Steg & De Groot, 2012).

This research addresses the intention-behaviour gap by examining how functional and sustainable food consumption goals can be effectively addressed and communicated through manipulating packaging design, increasing consumers' willingness to buy more sustainably. The focus is on examining how addressing various sustainable motives (biospheric, social altruistic, and egoistic) through packaging design affects consumers' willingness to buy (WTB) sustainable food products and whether such effectiveness is modified with one's value structures (self-transcendence and self-enhancement). In this case, biospheric is perceived as the baseline for sustainable products that are environmentally friendly through production and processing. Social altruism is assumed to be effective in increasing the WTB for consumers who are self-transcendence oriented, which can be expressed through warm-glow giving ("doing good" by evoking the sense of "feeling good") and social pressure ("doing good" to prevent "feeling bad") (Andreoni, 1990; Crumpler & Grossman, 2008; Dellavigna et al., 2012). Egoism emphasises functional consumption goals and effectively stimulates the WTB for self-enhancement-oriented consumers (de Groot & Steg, 2008; Schwartz, 1994).

To break down the problem, there will first be a review of the extant literature on the intention behaviour gap from an evolutionary perspective, which considers construal level theory (CLT), information asymmetry, and sustainable motives. Followed by how value structures and sustainability motives guide and shape decision-making and consumption behaviour. Based on the literature review, a theoretical framework and hypotheses will be developed to illustrate the cause-effect of packaging features, value structures, sustainable motives, and consumption intention. Then, design principles and marketing strategies regarding the SHIFT framework (White et al., 2019) and consumption values (Sheth et al., 1991; Smith & Colgate, 2007) will be transformed into design examples and tested on participants via implicit and explicit measurements to examine on how packaging features affect consumers WTB sustainable products.

A pre-study will examine which features most effectively represent the three values and be applied to five examples of organic green tea packaging. Based on various packaging design examples, the main study tests the hypotheses by analysing explicit and implicit consumers' psychophysiological reactions and WTB. Qualitative and quantitative data analysis will address whether feature cues related to biospheric, egoistic, or social-altruistic aspects can attract consumers' attention, evoke relevant sustainable motives, and increase their WTB sustainability when the consumption benefits addressed align with their value structure.

Finally, consistency or discrepancies between implicit and explicit results would be examined to draw conclusions about which packaging features are most effective in capturing attention, eliciting various emotional responses, influencing purchase intentions, and recognising trends in the decision-making process.

3. Literature Review

3.1 The Intention Behaviour Gap from an Evolutionary Perspective

Sustainable consumption (SC) is defined as consuming products produced and traded in compliance with standards for social and environmental aspects (Ingenbleek & Reinders, 2013). However causes regarding a lack of insight into sustainability and relevant purchase options (Young et al., 2009), having to compromise functional goals (McCarthy & Wang, 2022; Moisander, 2007), risk product quality (Park & Lin, 2020), rejection of high prices (Sriram & Forman, 1993), lack of availability or inconvenience (Rana & Paul, 2017; Zanolli & Naspetti, 2002), and time pressure all drastically reduce consumers' willingness to take sustainable options into account to full priority when making choices (Carrigan & Attalla, 2001; Grunert, 2011).

Therefore, despite consumers generally expressing positive attitudes and desire towards pro-social and pro-environmental behaviours, the ultimate purchase decisions are often less sustainable than they intend to be (Carrington et al., 2010; Hassan et al., 2016; Park & Lin, 2020; White et al., 2019). This discrepancy between what consumers say and do is known as the intention-behaviour gap.

The roots of such discrepancy can be understood from an evolutionary perspective, in which the tendencies humans have picked up to survive and reproduce are preserved throughout history and still impact modern cognitions and behaviours (Griskevicius et al., 2012). This perspective asserts that people interact with the contemporary world using brains evolved to confront ancestral problems regarding scarce resources and perishable food. Human brains were developed to adapt behaviours in the ancestral environment but often fail to produce adaptive behaviours nowadays, suggesting a mismatch between what human brains were designed to confront and what is encountered in the modern world (Ornstein & Ehrlich, 2000; Steg et al., 2015). This is because the environment and society have changed rapidly, while brain evolution takes thousands of years. As a result, the ancestral tendencies would trigger one to confront ready-made meals, calorie-dense fast foods or snacks by quickly devouring all available sweet or fatty foods and feeling immense pleasure, viewing them as scarce and perishable food, unaware of potential health risks it can cause. In this sense, tendencies should be considered when developing strategies to alter decision-making and impact behaviour, being more effective when they match human nature rather than contradict it (Andreoni, 1990; Song & Kim, 2018).

A total of five ancestral tendencies has been recognised: propensity for genetic self-interest, motivation for relative rather than absolute status, proclivity to copy others unconsciously, predisposition to be shortsighted, proneness to disregard impalpable concerns (Griskevicius et al., 2012). Selfish as these tendencies may seem, they were developed to survive the resource-lacking, risky, and dangerous ancestral environments. Although modern society no longer requires individuals to hunt and preserve to survive, our brain is not much different from what was evolved to deal with, as the environment changed much more rapidly than the brain's evolutionary speed. This suggests why food with high levels of sugar and fat is perceived as tastier as it provides more calories when resources are scarce, why people are willing to cooperate with others, as small communities have shown to be better at preserving communal resources, resembling the small yet stable hunter-gatherer groups. In this sense, demanding consumers to act for the environment and others is impractical, as humans have evolved to be selfish and self-interested (Griskevicius et al., 2012; Penn, 2003). Therefore, when marketers or food suppliers intend to communicate sustainability, it is pivotal to integrate the underlying values that motivate individuals towards environmentalism without excluding human nature, meaning the messages conveyed should be designed to make consumers want to do good (consume sustainably) by feeling good (emotional or functional reward, i.e. sense of pride or eat healthy) or to prevent feeling bad (i.e. the guilt for not helping others). This suggests a framework to confront the ill-defined phenomenon of unsustainable consumption by matching behavioural tendencies with possible solutions to bridge the intention-behaviour gap.

Propensity for genetic self-interest

Consumption and purchase behaviour occurs naturally when the aim is to fulfil self-interest, as humans have evolved to reap rewarding opportunities for themselves and force costs on others to survive and reproduce (Hawkes, 2017). Therefore, trying to persuade people to do good and pay costs purely for the sake of others is merely ineffective, which suggests the necessity to take egoism into account when promoting sustainable behaviour and that people are more likely to behave prosocially when the behaviour is grounded in evolutionarily selfish reasons

(Griskevicius et al., 2012). For instance, highlight product benefits that fulfil self-interest rather than urging self-restraint for prosocial benefits.

Interestingly, mindful and reflective consumers are successful examples that are no longer restricted by evolutionary tendencies, overcoming the intention-behaviour gap and tending to engage in sustainable consumption more easily (Fischer et al., 2017; Sheth et al., 2011). This is done through constant meditation as they purposely direct self-attention and awareness to the present, non-judgemental, being able to break free from habitual scripts and view the world with fresh eyes (Kabat-Zinn, 2003, 2009; Milne et al., 2020). Studies have shown that one who proactively reflects on the intangible facet of consumption (one's mindset pertaining to attitudes, values, and expectations regarding consumption behaviour) can raise awareness to evaluate economic-based consumption, monitor the activities of firms, and further guide and shape the tangible facet (engaging in consumption behaviour) (Armstrong, 2012; Bahl et al., 2016; Fischer et al., 2017; Kumar et al., 2023; Sheth et al., 2011). This means that a mindful consumer might internalise social values as personal values, viewing social justice and environmental protection as just as important as fulfilling self-desires and, hence, being dedicated to sustainable products.

However, while a minority (mindful and reflective consumers) might be entirely motivated to engage in sustainable consumption by pure biospheric goals (Amel et al., 2009; Fischer et al., 2017; Sheth et al., 2011), most people are less willing and unlikely to take the initiative to purchase for others' interest without fulfilling own's desire and consumption goals (Grunert & van Trijp, 2014; Lancaster, 1966), indicating the necessity to include self-beneficial cues in product communication.

Motivation for relative rather than absolute status

Status is a universal human desire, and people are shown to be more concerned about relative status than absolute status, as natural selection and success in evolution are always relative, as being better often implies better reproductive opportunities (Griskevicius et al., 2012). This desire contributes to costly behaviours that signal one's ability to incur costs, such as excessive consumption, buying luxurious goods, donating millions of dollars to charity, etc. Wealthy and helpful people tend to be perceived as more trustworthy, as desirable friends and romantic partners, and as better leaders (Griskevicius et al., 2010; Iredale et al., 2008), which also explains why people are willing to compete for status and reputation through self-sacrifice. In this sense, using this desire by depicting the high prevalence of the desired behaviour instead of undesirable behaviours is a promising strategy to evoke one to engage in other-benefit actions.

The proclivity to copy others unconsciously

While standing out can be a way to show prestige, mimicking behaviour and instinctively copying others have shown evolutionary benefits that allow an individual to survive in uncertain situations. Following the majority is an adaptive strategy for learning in social species, as the costs of individual trial-and-error learning are substantial (Griskevicius et al., 2012). Therefore, individuals automatically adapt their behaviour when under social pressure, fearing failure and losing competitiveness, further affecting survival and reproduction. Thus, imitation-based strategies can effectively stimulate people to behave in a particular manner, for instance, listing and ranking the most prosocial companies, celebrities, or ordinary citizens rather than encouraging people to be satisfied with their current status. The premise is people must be convinced to believe that many others behave the same way, even if most people do not engage in the desired behaviour. This tendency to follow the majority relates to descriptive norms, which refer to the socially accepted and expected behaviours, attitudes, and beliefs that are commonly practised by people in a particular group or society (Chiu et al., 2010; Ravis & Sheeran, 2003). Individuals conform to descriptive norms and shape their behaviour and decision-making

according to the norms in response to the desire to conform or avoid social disapproval. Therefore, if consuming sustainably becomes a descriptive norm, to which a person would be socially disapproved when not doing so, consumers would be likely to join in sustainable behaviors and decision-making (Elgaaid-Gambier et al., 2018; Lee, 2014; Melnyk et al., 2013; Ryoo et al., 2017; Salmivaara et al., 2021).

Proneness to disregard impalpable concerns

Human brains have evolved to value the present, here, and self rather than the distant future and others, and do not possess evolutionary mechanisms for reacting to large-scale but slow-moving environmental problems, such as climate change and hunger, since these issues are unlikely to be solved within a man's lifespan. Instead, humans have evolved in a world where the connection between behaviour and the environment is tangible and evident, meaning they can see the impact of their actions on the environment; for instance, if herds have grazed a field to its roots, herdsman would know it was time to migrate to another pasture. However, in today's modern world, people are disconnected from the environment, and they hardly see, hear, touch, feel or smell how their actions impact it (Griskevicius et al., 2012; Penn, 2003). Consumers buy food at stores and markets, so they don't witness the harmful impact of pesticides, the amount of water and energy used for processing and packaging, and they don't see the emitted pollutants pollute the air and water.

This division between rural production and urban consumption separates consumers from food origins and the production process, causing information asymmetry between consumers and producers, in which the former has limited access to knowledge and insight on food production, while the latter is aware of the social and environmental consequences their products and sourcing strategies bring (Caswell & Mojduszka, 1996; Hennessy, 1996; Horton, 2023). Therefore, consumers rely on the information provided to gain insight regarding the products, such as packaging claims, descriptions, advertisements, and labels (Schroback et al., 2023). For search attributes whose relevant information can be obtained and evaluated before consumption (price, size, colour, freshness), consumers can verify whether the given information aligns with the actual product. Information asymmetry of experience attributes, which refer to information that cannot be verified until consumption, such as taste and texture, are also temporary, as consumers can verify whether the given information aligns with the product after consuming (Anuar et al., 2020; Girard & Dion, 2010; Mohd Suki, 2016; Nelson, 1974; Saari et al., 2021; Stanton & Cook, 2019). However, for credence benefits such as health and sustainability, consumers cannot evaluate such authenticity even after experiences per se, and thus, rely on legislation and third-party verification units to ensure the creditability of credence information, as they ensure the legitimacy of the labels used, for instance, the organic label (Commission, 2018; Zander et al., 2015), FAIRTRADE (Nelson & Pound, 2009), food safety (Mohd Nawi & Mohd Nasir, 2014), animal-friendly (Eurobarometer, 2007), and health labelling (Peters & Verhagen, 2022).

Despite implementing implicit and explicit packaging features can act as a meaningful reminder to cue credence benefits and improve the sustainability communication (Granato et al., 2022), it is insufficient to transform such awareness into action as consumers would still need a tangible and visceral purpose to link between their consumption behaviour and the environmental impact the behaviour brings. This means how society or environmental issues can be impacted through individual consumption behaviour needs to become personally relevant in terms of temporal, spatial, social, and hypothetical.

Predisposition to be shortsighted

Natural selection has shaped human psychology to maximise the here and now, not a forward-looking process that anticipates what might happen next year, in ten years, or in future

generations (Griskevicius et al., 2012). If ancestors spent too much effort on future needs rather than on satisfying immediate needs, they would have been less likely to survive and reproduce (Kacelnik & Bateson, 1997). Since people have evolved to value the present over the future, influence strategies that fail to take this into account usually fight an uphill battle. The construal level theory argues such immediate, personal, direct, and certain gratifications attributed to the low-level construals (Maglio, 2020; Van Trijp & Fischer, 2010), which is experienced subjectively regarding the relative psychological distance according to an event's relative time, space, social, and hypotheticality distance compared to the self, here and now (Trope & Liberman, 2010; Trope et al., 2007). In food consumption, verifiable benefits take prominence as they provide feedback at a low psychological distance, such as taste and smell, which provides immediate feedback for self regardless of the satisfaction or disgust experience it brings. These subjective experiences tend to dominate future decisions in low-level construal choice situations, which in this case is now food consumption.

However, sustainability is perceived as a high-level construal concept, being relatively psychologically distant and abstract with the delayed, other-oriented, and challenging to-confirm characteristics (Carmi & Kimhi, 2015; Grunert & van Trijp, 2014; Lorenzoni & Pidgeon, 2006). Events at a high-level construal employ high-order mental to executive functions such as making reasoned judgments and evaluations, putting together strategic action plans for goal-pursuit, or inhibiting/overriding prepotent responses, such as impulses or habits (Hofmann et al., 2008). Therefore, when sustainability becomes a consideration for food consumption, consumers are required to evaluate the relationship between sustainability and consumption behaviour with effortful attention, deep thinking, and intensive reasoning. This is because one's desired goal towards sustainability could no longer be referred from the low-level construal experiences that were used for pragmatic considerations of consuming food. Instead, consumers must make additional efforts to trade off or consider a feasible balance between achieving sustainable goals and fulfilling functional goals (Eyal et al., 2008; Moisaner, 2007).

Therefore, unless an individual is sufficiently motivated to engage in effortful (systematic) processing, the default will be to use less effort to follow an information processing strategy based on simple rules, schemas, and prior knowledge, which is the heuristic processing (Chaiken & Ledgerwood, 2012; Chen & Chaiken, 1999; Moriarty, 2015). A key obstacle observed in sustainable consumption is consumers' limited cognitive focus in re-evaluating the credence benefits when being confronted with functional and practical needs at the same time, such as grocery shopping. An essential aspect is re-incorporating the awareness of credence benefits under low-level construal situations.

Communicating products regarding their sustainable characteristics could be more effective as the high psychological distance increases the motivation thresholds for consumers to evaluate and trade-off the pros and cons of consumption goals. Therefore, various studies suggest it might be promising to foster sustainable behaviour by reducing the psychological distance through appropriate "low construal" messages in agri-products, transforming sustainable information into more detailed, factual, and specific messages, leading to increased credibility and a higher willingness to act compared to highly construal messages (Jaeger & Weber, 2020; Jones et al., 2017; Trope et al., 2007). Jaeger and Weber (2020) confirmed this claim through an empirical study in which advertising organic products with concrete and low construal messages is generally more credible than abstract, high construal messages. Still, this does not guarantee higher purchase intention, as many studies have also confirmed that WTB is more relevant to whom the product benefits than how messages are framed (Goh & Balaji, 2016; Leonidou & Skarmas, 2017; Zhang et al., 2018). In this sense, the focus on driving sustainable consumption falls in recognising the motivations that trigger one to behave.

3.2 Value Structure and Sustainable Motives of Consumption

Biospheric, social-altruistic, and egoistic have been suggested to motivate sustainable behaviour (Liao et al., 2020; Stern & Dietz, 1994). Biospheric centres on the inherent value of the natural environment, with the mindset that all things in the ecosystem deserve moral consideration (de Groot & Steg, 2008; Stern & Dietz, 1994; Wesley Schultz & Zelezny, 1999). Social altruism is the selfless desire to benefit others rather than oneself, driven solely by empathy concerns (Batson, 2010). Egoism focuses on fulfilling one's welfare and self-interest, which implies egoists are less considerate of the impacts on others (Feinberg, 2007; Kareklas et al., 2014). Although biospheric and altruistic behaviours both show concerns towards the negative and/or positive consequences of other people or living beings, for instance, animal welfare, labour welfare, energy efficiency, pollution prevention, and carbon footprint (Kaminski et al., 2023; Nguyen et al., 2016; Schröder & McEachern, 2004; Weber & Matthews, 2008). Biospheric individuals show equal concern towards nature and humans, while social altruists prioritise human welfare over the entire biosphere (de Groot & Steg, 2008; 2012). Therefore, this study uses "biospheric" to address the broad aspects of sustainability. Although biospheric behaviours alone are already sufficient to fulfil sustainable goals, it is argued that only pure biospheric individuals are motivated enough to buy such a product, which is assumed to be insufficient for most consumers for the sake of fulfilling self-interests and benefits as consumption goals.

H1: Biospheric perceptions evoke consumers' WTB-sustainable products.

Therefore, egoism is necessary to make others' benefits personally relevant, lowering the construal level and shortening the psychological distance of product benefits. Therefore, altruistic and egoistic dimensions should both be addressed to effectively increase the intention of WTB sustainable product, extending consumption benefits beyond others and the environment and rewarding the consumer since the ultimate motive of inclining a person to act sustainably is self-interest (Andreoni, 1990; Song & Kim, 2018). When one is provided with rewards or information on behalf of their performed behaviour, it is acknowledged as feedback, which has been shown to encourage sustainable habits when provided over an extended period, being tangible and clear (White et al., 2019). For example, when households are informed they are using less energy compared to their neighbours and receive a smiley face to indicate the social approval for such action, it motivates people to continue with their pro-environmental behaviour (Griskevicius et al., 2012; Schultz et al., 2007)

H2: Egoistic perceptions strengthen consumers' WTB-sustainable products.

There has been a long-standing debate about pure altruism, considering whether the motivation behind altruism is, in fact, an egoistic feeling of warmth, such as pride, a sense of superiority and self-respect, known as "warm glow giving" (Song & Kim, 2019). "Warm-glow giving" is a common motivation for impure altruism, which reflects a mixed motivation of a philanthropic value in altruistic acts and self-centred benefits obtained from social reputation or prestige rather than acting on behalf of selfless concerns (Andreoni, 1990). The egoism motive embedded in altruistic behaviour could be understood by the incoherent display of motivation at proximate and ultimate levels. Benefits and motivation towards altruistic behaviour on a proximate level include culture, incentives, preferences, learning, utility, pleasure, happiness, values, emotions, and personality; however, why humans evolved to behave in a certain way would be the ultimate reason embedded in seemingly altruistic behaviour (Barrett & Kurzban, 2006). For instance, a proximate motivation towards a pro-environmental act might indicate a selfless concern of "being nice and doing good for the environment", while the ultimate goal that motivates this act could be a selfish desire to enhance reputation, self-image, and standing out in the community. From the evolutionary perspective, these ultimate "warm-glow giving" goals show a person's leading position and success, indicating reproductive fitness (Griskevicius et al., 2012). This supports the findings of various research on sustainable consumption, which has shown that altruism

significantly contributes to the warm glow and is inevitably connected to egoism (Andreoni, 1990; Cozzio et al., 2022; Ryan, 2014; Song & Kim, 2018).

Social pressure is acknowledged as another factor of impure altruism, which occurs when one prefers not to act for others' benefit but cannot resist due to the desire to impress others, avoid contempt, or a social backlash (Akerlof & Kranton, 2000; Dellavigna et al., 2012). An empirical study on door-to-door charitable giving showed significant evidence that social pressure is an essential determinant of prosocial behaviour (Dellavigna et al., 2012). The setting of this study was a door-to-door fund-raiser in a neighbourhood, in which some households are informed about the exact time of solicitation with a flyer on their doorknobs, meaning the informed households can decide to seek or avoid the fund-raiser. Results showed that the willingness to open doors decreased when informed with flyers and reduced even more when the flyer allows checking a Do Not Disturb box. Another study also argued that consumers are motivated to engage in positive action when dissociative out-groups pursue prosocial behaviours in public, as their successful performance threatens the consumer's group image and hence activates the desire to present a positive image in public (White et al., 2014). Therefore, regardless of whether an individual behaves altruistically for warm-glow or to respond to social pressure, it is evident that the underlying values motivating prosocial behaviour are to satisfy self-needs.

H3: Impure-social altruistic perceptions strengthen consumers' WTB-sustainable products.

Value structures are the underlying factors that motivate an individual to search for products that fulfil one's expected benefits and make purchase decisions, reflecting the beliefs and perspectives that guide an individual through the selection and evaluation of behaviour and events (Schwartz, 1992). According to the theory of basic human values, ten universal and cross-cultural value types were identified as guiding principles of a person's life. These were further divided into two dimensions regarding the conflicts and compatibilities experienced when pursuing them (Schwartz, 1994). The first dimension distinguishes self-transcendence from self-enhancement, with more pro-social values such as universalism and benevolence categorised in the former and pro-self-values regarding power, achievement, and hedonism in the latter (Steg & De Groot, 2012). The second-dimension sets openness to change from conservation values, reflecting whether individuals are open to new things and ideas versus whether they prefer tradition and conformity. Values structures in the first dimension have shown to be more relevant in the pro-environmental manners, with individuals who prioritise self-transcendent values being more likely to prioritise pro-environmental beliefs, attitudes, preferences, and actions compared to those who endorse self-enhancement values (Collins et al., 2007; De Dominicis et al., 2017; de Groot & Steg, 2008; Steg et al., 2014; Wesley Schultz & Zelezny, 1999).

H4: The effect of perception on WTB-sustainable products is moderated by the value orientation

Egoistics behave sustainably if the consequences of not doing so would affect them personally or oppose such behaviour when personal costs are perceived as higher than gains, which means they show concern for environmental issues for fear of the negative consequences that may result themselves. Individuals who prioritise self-enhancement values have been shown to be motivated by egoism and are more likely to act sustainably when self-benefits are addressed (de Groot & Steg, 2008; Liao et al., 2020; Steg & De Groot, 2012; Stern & Dietz, 1994; Stern et al., 1999; Stern et al., 1993), which aligns with the ancestral tendency to prioritise self-interests before the group welfare (Griskevicius et al., 2012; White et al., 2019).

H4a: The effect of egoistic perceptions on WTB is stronger for self-enhancement-oriented consumers.

People who are motivated by impure-altruistic perceptions are assumed to be more oriented towards self-transcendence. This is because how they perceive a person's values, goals, and ideals does not need to be directly linked to their own self. As a result, they tend to be more responsive to external factors that impact their social status, feelings, and cognition (de Groot & Steg, 2008;

Liao et al., 2020; Steg & De Groot, 2012; Stern & Dietz, 1994; Stern et al., 1999; Stern et al., 1993).

H4b: The effect of impure altruistic perceptions on WTB-sustainable products is stronger for self-transcendence-oriented consumers.

Although egoistic-oriented and altruistic-oriented people care about different aspects and behave on behalf of varying value structures, the fact that self-benefit is always included in their target goals is inevitable. The difference falls in the scope of self-definition: egoistic-oriented people have a narrower self-definition that excludes others and prioritises self-enhancement values that focus on self-benefits and tangible rewards. In contrast, people showing altruism have a broader sense of self where they see themselves as part of nature and societal groups (Wesley Schultz & Zelezny, 1999). Therefore, while seemingly investing in sustainability on behalf of others' benefit and welfare, egoists and altruists might, in fact, indirectly benefit themselves, which could be a long-term benefit to maintain the ongoing supply of goods and services from natural resources for current needs without compromising future generations (El Bilali, 2019) or a short-term benefit to feeling good (warm-glow giving) when knowing they are responsible for benefiting others (Boobalan et al., 2021; Ryan, 2014; Song & Kim, 2019).

3.3 Sustainable Packaging Design Principles

When consumers search for food products or fast-moving consumer goods (FMCG), they look for feature cues that imply the desired consumption goals and benefits, which can be anything ranging from personal needs to situational goals or social norms (Grunert & van Trijp, 2014; Lancaster, 1966). The cues will allow consumers to shape their perceptions of the product based on its characteristics, called inference formation. If the inferences drawn from the product information are aligned with one's consumption goals, trial and willingness to try the product emerge. The consumption experience will become a pivotal determinant for repeat purchases and future consumption. When the purchase and consumption experience are proven rewarding, people are more likely to repeat them in the future, setting the foundation towards the habitual, goal-oriented, heuristic, and time-pressured patterns of food consumption (Bohner et al., 1995; Grunert, 2011; Grunert & van Trijp, 2014; Wood & Neal, 2007).

Manipulating feature cues on food packaging has shown to be a promising strategy to effectively communicate consumption goals and benefits, as they catch attention and infer consumers' information processing and decision-making process (Di Cicco et al., 2021; Gil-Perez et al., 2019; Granato et al., 2022; Koutsimanis et al., 2012; Labrecque et al., 2013; Marsh & Bugusu, 2007; Rebollar et al., 2017; Talati et al., 2017). Successful communication should contain feature cues that allow consumers to form intended perceptions through explicit and implicit cues (Barthes, 2000; Granato et al., 2022; Moriarty, 2004). Explicit cues refer to the denoted level of direct literal cues such as claims, logos, and labels; implicit cues are the connotated level that requires interpretation, such as analogies, which function of the correspondence between the two domains, and that knowledge can be transferred from one to another (Granato et al., 2022; Gregan-Paxton & John, 1997; Schifferstein et al., 2022). The SHIFT framework provides a guideline to implement altruistic and egoistic concepts into practices that allow consumers to be more inclined to engage in sustainable behaviours. People are more likely to change negative behaviours (antisocial and anti-environmental) and maintain positive behaviours when Social Influence, Habitual Formation, Individual Self, Feelings and Cognition, and Tangibility are effectively considered and leveraged (White et al., 2019).

In this study, biospheric is the fundamental goal for all combinations of consumption choices, which means the product examples presented to participants are assumed to be sustainable and achieve explicit pro-environmental and pro-social production. When communicating a product's pro-environmental benefits, tangibility and habit formation are the two important principles that

should be kept in mind, as they aim to convey relevant information with low-level construal messages. Quality labels and certified logos are also often used to communicate a product's credence features, as they represent the legitimacy of its creditability of third-party verification units (Commission, 2018; Peters & Verhagen, 2022). This study applies the Organic and Fairtrade labels as the feature cues to evoke biospheric perception. Organic signifies the product is produced according to strict pro-environmental standards (improving soil fertility, refilling cleaner water and air in the ecosystem, enhancing biodiversity, and restricting the use of chemicals, pesticides, and other artificial additives) (Boobalan et al., 2021). Fairtrade focuses on the social aspect of sustainability, which ensures equitable trading arrangements for disadvantaged producers by providing primary producers with a minimum price that covers their living costs (Ingenbleek & Reinders, 2013). These two credence benefits are highly recognisable in the European market, where consumers are aware of their meaning and relation with the biospheric benefits (Commission, 2018; Willer et al., 2019).

H5a: Organic and Fairtrade are effective packaging features cues to evoke biospheric perception.

Addressing feelings and cognitions is essential for evoking impure altruism. Packaging features that address prestige and reputation respond to humans' tendency to be motivated by relative rather than absolute status. Typical analogies to express social altruism in terms of giving and helping include sharing food, donations, giveaways, volunteering, and adults assisting children, allowing consumers to display their helpfulness, wealth, and prestige (Muralidharan & Sheehan, 2018; Schwartz & Loewenstein, 2017). Emphasising social influence is critical to evoke the desire to fit in and follow trends, which respond to human's unconscious tendency to imitate the authorities and majorities. Cues and analogies that address the fear of rejection or socially approved elements and more commonly engaged by others is a practical idea that triggers one's proclivity to copy others unconsciously (Schultz et al., 2007)—for instance, following vegetarian/vegan diets to blend in with peers while feeling guilty when not doing so, or emphasis selling product to “catch up” with the trend. The popularity of a product is addressed to evoke an impure-altruism perception in this study, as the concept implies that the product is socially approved and people should also own the product to avoid being left behind in the trend. Catching up with the trend is another way to show prestige and reputation, showing an individual's consciousness and awareness towards the product's benefits, depending on the issues the product addresses. For instance, increasing numbers of consumers bring their own shopping bags to supermarkets to avoid paying for extra plastic bags, show their altruistic and helpful behaviour towards the environment, and catch up with the socially approved trend to avoid judgements (Karmarkar & Bollinger, 2015).

H5b: Packaging features that cue the product's popularity effectively evoke impure-altruistic perception.

Packaging that aims to evoke egoistic perception should contain features that indicate self-concept, personal norms, self-consistency, self-interests, and self-efficacy directly satisfy self-interest regarding a product's functional, sensory, emotional, or epistemic values (Sheth et al., 1991; Smith & Colgate, 2007; Van Riemsdijk et al., 2017) such as health, higher nutritional levels, well-being, food safety, taste, and self-presentation (Hwang, 2016; Irene Goetzke & Spiller, 2014; Lea & Worsley, 2005; Ott, 1990; Sivapalan et al., 2021). Health has been a common egoistic benefit addressed in sustainable products as the concept is tangible and relevant to the consumer, focusing on communicating what is in for the consumer.

H5c: Healthy imagery are effective packaging features cues to evoke egoistic perception.

WTB of a product is assumed to be directly dependent on the consumer's consumption pattern and frequency. The more often and more familiar one consumes a product, the more likely one will buy the product; on the other hand, the less frequently and unfamiliar one consumes a product, the less likely one will purchase it (Ji & Wood, 2007; Verbeke & Vackier, 2005).

H6: Consumption patterns and frequency directly affect consumers' WTB-sustainable products.

Figure 1 illustrates the conceptual framework of this study regarding packaging cues evoking sustainable motives and the moderating effect of value structure on consumers' WTB.

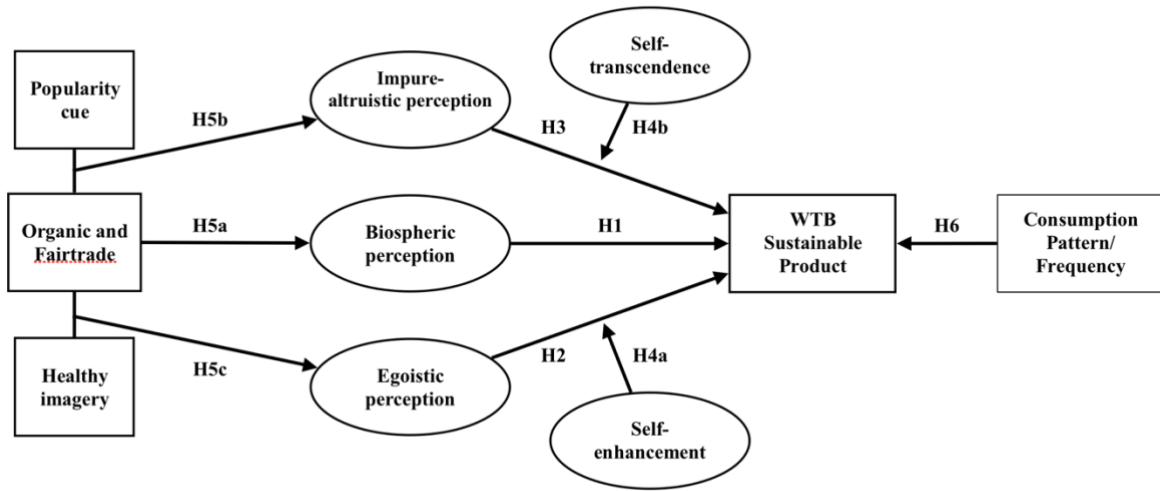


Figure 1. The Conceptual Framework

4. Empirical Investigation

4.1 Pre-Study

4.1.1 Sample and Method

Pre-test was done to extract the most representative cues for self-interest and social altruism, which will be applied later in the main study. An online questionnaire, which was carried out through Qualtrics XM Platform, was developed to collect Dutch consumers' perceptions of which feature cues best represent the concepts of egoistic, warm-glow giving, and social pressure, which were expressed in the form of health, kind, generous, or charitable giving feeling, and popularity. Participants were presented with three questions: "Which of the following features do you think best represents the 'three concepts' of Organic green tea?". Participants were asked to choose from five options regarding three claims, one label/logo, and an image they thought was most relevant to the concepts (Appendix). The significance of each feature cue was analysed with a one-sample t-test using RStudio; results showed significance when the p-value < 0.05.

4.1.2 Results

22 participants responded to the pre-test. According to the results, the feature cues participants chose to represent the three concepts have all shown significance: The healthy food label was shown to best represent the health benefits of organic green tea, $p < 0.001$; the Fairtrade logo most communicates a kind, generous, or charitable giving feeling of organic green tea, $p < 0.001$; Best-Seller sticker was shown to communicate best the "popularity" of organic green tea, $p < 0.001$. The feature cues are further implemented into five packaging design examples for the main study.

4.2 Main Study

4.2.1 Design

The effects of packaging feature cues were tested through an experimental study of a 2x2 factorial design with a control group (CG) and four design examples. In this study, the CG acted as the baseline of sustainable products, which does not imply benefits other than pro-environmental benefits, in which only pure biospheric individuals were motivated enough to buy such a product. In this study, CG is compared with the treatment groups to standardise the absolute effects of the control variables and eliminate individual differences that might affect deviations for the treatment groups (Strandberg, 2015). The treatment groups were developed based on CG, determined by the absence or presence of the healthy and popularity cue, which are the independent variables (IVs) for this study (**Error! Reference source not found.**).

Table 1. Factorial Design

Control Group (CG): Biospheric		Popularity cue	
		Without	With
Health Cue	Without	CG + Warm-glow giving (WG)	CG + WG + Popularity
	With	CG + WG + Health	CG + WG + Popularity+ Health

4.2.2 Stimulus

The control group is an Organic green tea product that aims to evoke pure biospheric perception, which includes features in terms of an Organic logo, the product name “Organic Green Tea”, and a brand image. The baseline example (FT), which operates as the cue for warm-glow giving, is Organic-Fairtrade green tea, with Fairtrade expressed with the FAIRTRADE logo. The social pressure example (BS) expresses “Popularity”, which is operated with an image of a best-seller stamp. The egoism group (HF) expresses a health concept and is operated with a “Healthy Food” logo. The fourth treatment group (all) consists of all feature cues expressing biospheric, warm-glow giving, social pressure, and egoism (**Error! Reference source not found.**).



Figure 2. Design Examples

4.2.2 Participants

The sample size is estimated using a power analysis of the GPower software.

For explicit measurements, the effect size (f) is 0.25. Since there should not be replicants across variables, each sample group should have at least 32 participants, resulting in a total sample size of 128 (32×4 groups). Participants for the online questionnaire were reached out through online and offline promotion, online regarding posting on social media and chat groups and offline regarding posters and handouts to students in the university. Participants were also invited to share the questionnaire with their network to reach a sufficient sample size.

For implicit measurements, the statistical test is a two-way ANOVA, in which the effect size (f): 0.4; α err prob: 0.05; Power ($1 - \beta$ err prob): 0.8; Numerator df: 1; Number of groups: 4. A large effect size is used since psychophysiological data fluctuates widely due to individual differences such as diseases, abnormalities and more. The total sample size suggested f is 52, meaning 13 ($52/4$ groups) participants are needed.

4.2.3 Materials

This study collects both explicit and implicit measurements. The former is measured through an online questionnaire carried out through the Qualtrics XM Platform. The latter collects psychophysiological measurements through Noldus Hub, a software suite that streamlines multimodel research, providing data and insights into human behaviour collected from eye tracking (ET) and facial expression recognition (FER).

4.2.4 Procedure

4.2.4.1 Explicit

Explicit measurements were collected through an online questionnaire, which surveyed Dutch consumers' perceptions, emotions, WTB, and overall liking (Casado-Aranda et al., 2023; Lang et al., 1995). The questionnaire was initiated with an introduction to this study and an estimation of the required time to complete, followed by instructions and what is expected throughout the process. The participants were first presented with the control group. They gave ratings regarding their sustainable perceptions and WTB towards the design, which was done to eliminate individual differences and manipulate the reliability of the measurements on perceptions. Then, one of the four treatment groups was randomly assigned to the participants, who filled out the same questions with additional quantitative feedback to reason the decisions made. Finally, participants answered questions regarding their value structure, tea consumption patterns, and social-demographic background.

4.2.4.2 Implicit

Implicit measurements, in which psychophysiological data was collected, were conducted in Wageningen University & Research, with a room exclusively set up for the study. Two computers were involved in the experiment, one to display instructions and stimuli to the participants, connected to an eye tracker and camera that tracks gaze and comprehension of emotions, and the other for researchers to monitor the process. Participants will be facing the wall while the researcher is seated facing the participant. Instructions and design stimuli are displayed to the participant in video form and will automatically play after the participant hits start. Participants were asked to turn off or mute their mobile phones to eliminate potential interference and interruptions.

After participants arrived, they were told to assist with the trial and feedback on a new system and sign an agreement to participate. Then, they would sit in front of the participant's computer, adjusting their distance to the screen and chin lift angle in order to calibrate with the eye-tracker.

When calibration was successful, the screen and facial recording automatically started, and participants were presented with instructions and what to expect. Following the reading, all participants were displayed with the five design examples in the sequence of “control group”, “with popularity cue”, “with healthy cue”, “without both cues”, and “with both cues” each displays six seconds followed by three seconds of black screen, which is also at the beginning and between (Liao et al., 2015). Finally, participants were required to complete an interview with the researcher to explain their liking and WTB of choice (Appendix 3.). Upon completion, participants were informed of the true purpose of the empirical study and received a reward for participation.

4.2.5 Explicit Measurement: Online Questionnaire

4.2.5.1 Willingness to Buy

WTB for each design example was measured on a 5-scale Likert score on the claim “I am willing to buy this product”, to which 1 is “strongly disagree”, 2 is “somewhat disagree”, 3 is “Neither agree nor disagree”, 4 is “somewhat agree” and 5 is “strongly”. Possible reasons affecting participants’ WTB were examined through a qualitative response: “Why are you willing/not willing to purchase this product?”

4.2.5.2 Sustainable perceptions

The formation of biospheric, egoistic, and impure altruistic perceptions by each packaging example was examined with a 5-scale Likert score, in which participants respond to a list of statements in terms of whether they find the product to be “environmentally friendly”, “sustainable”, “helpful for farmers”, “social just”, “healthy”, “beneficial for self”.

4.2.5.3 The moderating effect of values orientations

Participants' value structure, assumed to impact WTB, was measured with a scale based on de Groot and Steg (2008) and Schwartz (1992) distinguishing between self-enhancement, self-transcendence, or purely biospheric individuals. There are 12 descriptions in total, with 4 representing each value. Respondents are requested to rate the importance of the 12 values on a rating scale from 1-5 with the statement “as a guiding principle of my life”, with 5 being the most important and 1 being the least important (Appendix).

4.2.5.4 Tea Consumption Pattern

Tea consumption frequency was collected by asking consumers to fill out the numerical answer regarding the question: “How many cups of tea would you drink in a day?”

4.2.5.4 Evoked emotions

Participants responded to their feelings towards the treatment groups using a CATA (check all that apply) checklist consisting of ten emotions in terms of neutral, happy, sad, angry, surprised, scared, disgusted, confused, bored, and interested.

4.2.6 Implicit Measurement: Noldus-Hub

Implicit measurements include psychophysiological data regarding participants’ attention, executive function, information processing, cognitive load and emotion. After collecting implicit data, participants were interviewed with three questions to recall what they saw during the

experiment, provide preference among the stimulus and WTB, and explain their decisions (Appendix). The aim is to examine whether conscious thoughts match spontaneous physical reactions. Eye-tracking and facial reading data are downloaded from Noldus-hub and finalised to tables in Excel.

4.2.6.1 Eye Tracking

Eye tracking (ET) is one method that measures eye gaze quantified as fixation duration, fixation sequence, pupil diameter, and blink rate (Bialkova et al., 2020; Fenko et al., 2018; Fiedler et al., 2020; Gidlöf et al., 2017). The area of interest for eye tracking is segmented into four sections (Figure 3): the Organic logo, FAIRTRADE logo, best seller sticker, healthy food logo, and product name. The surface area each feature covers from largest to smallest is “product name”, “best-seller sticker”, “healthy food logo”, “FAIRTRADE logo”, and “Organic logo”



Figure 3. Area of Interest (ROI) for Eye-Tracking

The fixation points (X,Y) of Noldus Hub data are documented as the relative position of the screen, which is the eye-tracking range. Therefore, the boundaries for the AOIs are transformed to their relative position on the screen by dividing the pixel coordinates of the vertexes by (1920, 1080), which is the length and width of the stimuli material. Pixel coordinates are identified using a pixel examination website, “Pix Spy”.

Time data exported from Noldus Hub is in the date format (yyyy-MM-dd HH:mm:ss.ffff). The format is transformed from date to length, in which the starting time is 0 seconds. The starting point for each participant is recognised at the screen recording time when the first stimuli appear. This timing is identified using the HitFilm application.

4.2.6.2 Facial Expression Recognition

Facial expression recognition (FER) identifies facial movements and extracts emotion scores by capturing facial movements through videos (Bartlett et al., 1999). The emotion scoring falls between 0 and 1, where 0 means the absence of an emotion and 1 is a full expression of the emotion. These data are recorded for 10 emotions, namely happy, sad, neutral, confused, bored, disgusted, scared, interested, angry, surprised.

4.2.6.3 Interview

Participants are asked 3 interview questions after implicit measurement with the aim of gaining insights into their conscious reasoning regarding their perceptions, preferences, and WTB towards the stimuli: "What do you remember from the sets of images shown to you?"; "Which one did you like the most? Why?"; "Are you willing to buy this product? Why or why not?"

4.2.7 Data Analysis

Data analysis was conducted with the SPSS. Statistical tests are significant when $p\text{-value} < 0.05$.

The reliability of the value structure is assessed through factor analysis to confirm the three-dimensional structure among the 12 value items. Factor scores are extracted by the average of each validated item within the dimension, representing self-enhancement, self-transcendence, and purely biospheric, respectively. Self-enhancement and self-transcendence values will then become the measurements for the moderation effect on sustainable perception towards WTB.

Each sustainable perception will be validated via a manipulation check of the internal consistency test with Cronbach's alpha. "Environmentally friendly" for biospheric perception measured by "sustainable" for manipulation check, "helpful for farmers" for impure altruistic perception measured by "social justice" for manipulation check, and "healthy" for egoistic perception measured by "benefit for self" for manipulation check.

Age, tea consumption frequency (cups/day), participants' tea consumption (yes/no), and value structures across treatment groups were checked for randomisation with a t-test.

4.2.7.1 Direct Effects on the Dependent Variable

The direct effect of tea consumption frequency (cups/day) and pattern (yes/no) on WTB is examined using linear regression. Significant correlation coefficients imply a direct effect between WTB and tea consumption patterns, validated as the covariate for direct and indirect effects on WTB.

The direct effect of IVs on WTB is examined with ANOVA. A significant F-value indicates mean differences in WTB across treatment groups and the presence of a direct effect of the feature cues on WTB.

The direct effect of sustainable perception on WTB is evaluated by linear regression, in which significant correlation coefficients indicate a validated relationship between the respective perceptions with WTB.

4.2.7.2 Direct Effects of IVs on Mediators

Multivariate relationships between all pairs of feature cues and sustainable perceptions are tested with MANOVA, significant F-values imply homogeneity of variances across designs on various perceptions and that multivariate effects are present. One-way ANOVA is then used to determine which IVs contribute to the corresponding sustainable perceptions.

4.2.7.3 Moderation effects

The moderation effects of value structures on sustainable perceptions and WTB are assessed with linear regression models. Significant t-value implies the presence of moderating effects

4.2.7.4 Integral Model Effect

The direct and indirect effects of the integral model will be examined with SPSS PROCESS macro model 15. If the IVs do not show statistical evidence of a direct effect on WTB, testing the integral model effects and examining the mediating and moderating effects are unnecessary, as the subsequential condition was not fulfilled.

4.2.7.5 Emotion Response

Chi-square were conducted to compare the emotional responses between the different designs. Significant mean differences indicate that the feature cues effectively elicit different emotional feelings for participants. The results will be compared to the facial reader's emotional score to examine the congruency or incongruency of explicit and implicit measurements towards the evoked perception.

4.2.7.6 Eye-tracking

Eye-tracking results measure fixation durations, examining which packaging feature attracts the most attention (Carter & Luke, 2020; Henderson, 2003, 2011; Rayner, 1998, 2009). Fixation duration is a metric used to gauge the amount spent focusing on an area of interest (ROI), as outlined in Figure 3, which can help determine which feature cues are the most captivating. The sum of all fixation points identified within an ROI, which the eye-tracker detects when the gaze fixates, is calculated to derive fixation duration. The number of fixation points within an ROI corresponds to the time spent observing that region, ultimately resulting in the fixation duration. Therefore, more fixation points indicate a longer fixation duration, suggesting that the ROI captured more attention. Whether the average fixation duration differs across stimuli and features is assessed with the F-test.

4.2.7.7 Facial Expression

A comparison of the strength and type of emotions evoked across stimuli and feature cues is examined by one-sample t-tests on the relative average emotional scores, which are calculated by subtracting the average emotional score between the treatment and control groups. Significant t-values indicate the stimuli and feature cues can evoke different emotional reactions.

4.2.7.8 Qualitative data

The reasons why participants want to buy (WTB) or are unwilling to buy are further explored using quantitative responses, which are then transformed into concept codes. Qualitative responses from the online questionnaire are categorized into codes that focus on why participants like or dislike a product, as well as the motivation behind their willingness or unwillingness to buy.

The interview answers are recorded and transformed into a script. The first question assesses which feature cues caught the most attention and provides evidence corresponding to eye-tracking results. The second question examines personal preferences that correspond to participants' perceptions of the packaging designs. The third question delves into the underlying reasons for unwillingness to buy (WTB) and will also be coded in the same way as the quantitative data collected from the online questionnaire.

5. Results

249 consumers participated in the online questionnaire for explicit measurements. 147 datasets were available for further analysis after eliminating those that did not fully complete the questionnaire. The participants involved 36 males, 106 females, 2 Non-binary/third gender, and 3 Prefer not to say. 54 were Dutch, and 91 currently live in the Netherlands and are from a wide range of nationalities, including the USA, Belgium, Brazil, British, China, Estonia, Finland, France, Germany, Greece, Hungary, Indonesia, Italy, Japan, Korea, Luxembourg, Philippines, Romania, Slovenia, South Africa, Switzerland, and Taiwan.

32 participants were assigned to the treatment group with both health and popularity cues (1,1); 42 participants were assigned to the treatment group with the health cue and without the popularity cue (1,0); 34 participants were assigned to the treatment group without the health cue and with the popularity cue (0,1); 39 participants were assigned to the treatment group without both cues (0,0) (Table 2).

Table 2 Descriptive of assigned IVs

		Popularity cue	
		.00	1.00
Health cue.00	0.00	39	34
	1.00	42	32

5.1. Reliability assessment of item scales

5.1.1 Value Structure

The Principal Axis Factoring extraction method of factor analysis confirmed the three-dimensional structure among the 12 value items (Table 3), with a sampling adequacy of 0.84 and significance for Bartlett's Test of Sphericity ($df = 66$, $p\text{-value} < .001$). The first factor is pure biospheric, consisting of "Preventing Pollution", "Respecting the Earth", "Unity with Nature", and "Protecting the environment", representing the purely biospheric value structure. The second factor is self-transcendence, consisting of "A world at peace", "Equality", "Helpful", and "Social Justice", representing self-transcendence. The third factor is self-enhancement, consisting of "Social power", "Wealth", and "Authority" represent self-enhancement. "Influential" was not shown for either factor. The estimate Cronbach alfa for the value dimension Biospheric is 0.861, Self-transcendence is 0.749, and Self-enhancement excluding item "Influential" is 0.657. The variance inflation factor (VIF) between each value structure after varimax rotation is 1, confirming the absence of multi-collinearity and the structural independence of the value structures.

Table 3 Values Rotated Factor Matrix

	Factors		
	Pure biospheric	Self-transcendence	Self-enhancement
Social power	-.054	.035	.740
Wealth	-.010	-.014	.572
Authority	.087	.115	.589
Influential	.166	.319	.281
A world at peace	.318	.576	.164
Equality	.301	.627	.066
Helpful	.296	.482	.074
Social Justice	.209	.677	-.054
Preventing Pollution	.643	.270	-.003
Respecting the Earth	.713	.358	-.043
Unity with Nature	.765	.248	.168
Protecting the environment	.766	.331	-.022

Extraction Method: Principal Axis Factoring.

Rotation Method: Varimax with Kaiser Normalization

a. Rotation converged in 5 iterations.

5.1.2 Sustainable Perceptions

Validation of each measurement on the corresponding sustainable perception is tested through a manipulation check with Cronbach's alfa (α). “Environmentally friendly” is the measurement of biospheric perception, to which the internal consistency is validated with the variable “Sustainability” ($\alpha = 0.88$); “Helpful for farmers” is the measurement of impure altruistic perceptions, to which the internal consistency is validated with the variable “Social justice” ($\alpha = 0.778$); “Healthy” is the measurement of egoistic perceptions, to which the internal consistency is validated with the variable “Beneficial for self” ($\alpha = 0.778$). The results validate that each sustainable perception can be represented by its corresponding concept.

5.2. Randomisation check

The randomisation of the dataset is checked with F-tests across treatment groups ($df = 3$) on tea consumption frequency (cups/day), tea consumption patterns (yes/no), age, and value structure. All variables support mean homogeneity and data randomisation. Tea consumption frequency does not show significant mean differences (F-value = .0762, p-value > .5). Participants' tea consumption pattern across treatment groups does not show significant mean differences (F-value = .105, p-value > .5). Age across treatment groups does not show significant mean differences (F-value = 1.459, p-value > .1). For the three factors recognised under value structures, pure biospheric does not show significant mean differences (F-value = .994, p-value > .1); self-transcendence does not show significant mean differences (F-value = .834, p-value > .1); self-enhancement does not show significant mean differences (F-value = 1.107, p-value > .1).

5.3. Hypothesis testing

5.3.1 Direct Effects on WTB

The correlation coefficient between WTB and tea consumption frequency is 0.148 (p-value > 0.05), implying little relation with WTB. However, the correlation between WTB and tea consumption pattern is 0.511 (p-value < 0.001), implying whether one consumes tea or not has a higher relation with WTB. The result of univariate linear regression also shows a significant direct effect of tea consumption on WTB (F-value = 13.082, p-value < 0.001), which supports the variable as the covariate. Therefore, hypothesis 6 is supported by the evidence that tea consumption patterns directly affect WTB-sustainable products.

The direct effect of independent variables (IVs) on willingness to buy (WTB) is examined in two dimensions using ANOVA. The first dimension tests the original score for each participant, but the results do not show significant direct effects of IVs on WTB (Adjusted R Squared of corrected model = .064). The F-value for the popularity cue on WTB is .409 (p-value > .5), the F-value for the health cue on WTB is .084 (p-value > .5), and the F-value for the interaction between popularity and health cues is 1.134 (p-value > .1). In the second dimension, the WTB score difference between the treatment and control groups for each participant is tested, and the results show a significant direct effect of the health cue on WTB (Adjusted R Squared of corrected model = .090). The F-value for the popularity cue on WTB is .999 (p-value > .1), the F-value for the health cue on WTB is 7.284 (p-value < .01), and the F-value for the interaction between popularity and health cues is 2.672 (p-value > .1).

Although the health cue significantly affects WTB in the second dimension, the R-squared value implies low impact. Therefore, the direct effects of IVs on WTB are based on the results of the first dimension, in which no effects were shown to be significant. In this sense, the integral model effect will not be tested.

The effect of sustainable perceptions of CGs and TGs on WTB are examined with linear regression (Table 4). For the control group, results show that biospheric and impure altruistic perceptions significantly impact WTB, while the effect of egoistic perception on WTB is not apparent. For the treatment groups, impure-altruistic perception also appears to affect WTB, and biospheric and egoistic perception do not show a significant impact.

Table 4 Regression Coefficients of Sustainable Perceptions on WTB

	Biospheric		Impure altruistic		Egoistic		Tea consumption	
	CG ^a	TG ^b	CG ^a	TG ^b	CG ^a	TG ^b	CG ^a	TG ^b
Standardized Coefficients Beta	.164	.101	.308	.285	.031	.120	.117	.139
t-value	1.999*	1.150	3.712**	3.269***	.371	1.303	1.519	1.771
VIF	1.152	1.363	1.187	1.328	1.194	1.482	1.028	1.072
CG: control group; TG: treatment group								
a. R = .418, R-square = .1740, p-value < .001; b. R = .435, R-square = .190, p-value < .001								
p-value: * < .05, ** < .01, *** < .001								
no collinearity if VIF < 10								

Hypothesis 1 is supported by the significant t-value of the control group's biospheric perception and WTB-sustainable products, showing evidence that individuals who form biospheric perceptions are WTB-sustainable products. Hypothesis 2 is not supported as no evidence exists that egoistic perceptions strengthen consumers' WTB-sustainable products. Both control and treatment groups show significant evidence that impure altruistic perception affects WTB an

extended linear regression is tested to examine if the perception of the two groups has a different extent of impact on WTB. The regression coefficient ($B = 0.206$, $p\text{-value} < 0.001$) suggests that the extent of impure altruism perceived in the treatment group has a significantly higher impact on WTB than in the control group. This supports hypothesis 3, in which impure-altruistic perceptions strengthen consumers' WTB-sustainable products.

5.3.2 Direct effects of IVs on mediators

According to the results of the MANOVA (Table 5), the significant intercept suggests that biospheric, impure altruistic, and egoistic perceptions were evoked when the treatment groups were displayed. However, the results do not indicate significant evidence that sustainable perceptions are evoked by the feature cues, as the F-values for popularity cue on impure altruistic perception and health cue on egoistic perception are insignificant. There is only an interaction effect between popularity and health cues on impure altruistic perception and no direct effect of each cue on perception. Therefore, hypothesis 5 is not supported, as no significant evidence supports the direct effect of feature cues on the corresponding perceptions.

Table 5 Perceptions on Treatment Groups

(F-value)	Biospheric perception	Impure altruistic perception	Egoistic perception
Intercept	3016.810***	2736.203***	3768.663***
Popularity cue	.098	.270	.319
Health cue	.634	.152	2.430
Popularity*Health cues	.044	11.174**	.002
p-value: * < .05, ** < .01, *** < .001			

5.3.3 Moderation Effects

The interaction term of self-transcendence and impure altruistic perception is 0.117, with t-value 1.487 ($p\text{-value} > .1$). The correlation coefficient for their interaction effect on WTB is 0.025 with a t-value of 1.020 ($p\text{-value} > .1$). The interaction term of self-enhancement and egoistic perception is -0.007, with t-value -0.051 ($p\text{-value} > .5$). The with correlation coefficient for their interaction effect on WTB is -0.014, with t-value -0.578 ($p\text{-value} > .5$).

This show moderation effects of the model are not significant and therefore do not support hypothesis 4, in which it is not evident that the value orientation moderates the effect of perception on WTB-sustainable products.

5.4 Emotion response

The CATA response to emotions is examined with the expected frequencies of Pearson's chi-square value with 1 degree of freedom (Table 6). Neutral, interested, and happy are the most chosen emotions, while the remaining have expected count values lower than 5, invalid for statistical examination. No responses were recorded for disgust and fear. Among the recorded emotions, only "Neutral" shows a significant difference between with and without health cues, in which more participants chose the emotion with a health cue than without. Numerical values for neutral, happiness, and interest are higher without a popularity cue. The health cue potentially relates to more participants being assigned to the treatment group with a health cue than popularity.

Table 6 Expect Frequencies of Chi-square Statistics for Emotion CATA responses

	Popularity cue			Health cue		
	No	Yes	χ^2 value	No	Yes	χ^2 value
Happy	20.4	16.6	.022	18.4	18.6	.814
Sad	1.7	1.3	.166	1.5	1.5	.317
Neutral	53.4	43.6	2.537	48.2	48.8	4.121*
Confused	2.2	1.8	1.506 ^a	2	2	1.056 ^a
Bored	4.4	3.6	1.354 ^a	4	4	.558 ^a
Disgusted	-	-	-	-	-	-
Scared	-	-	-	-	-	-
Interested	24.4	21.6	1.487	23.8	24.2	.996
Angry	.6	.4	.820 ^a	.5	.5	.993 ^a
Surprised	1.1	.9	2.488 ^a	1	1	.000 ^a

Pearson Chi-Square (df=1), Bonferroni correction to adjust significance level

^a One or more cell have expected frequency less than 5

p-value: * < .05, ** < .01, *** < .001

5.5 Implicit measures

23 Dutch students were recruited to participate in the lab experiment for implicit measurements, and data from 21 of them were feasible for further analysis, as the datasets for the remaining 2 participants were eliminated due to unreliable caused by missed calibration with the eye-tracker and unstable signals. Among the 21 valid datasets, 11 were male, and 10 were female, all studying at Wageningen University.

5.5.1 Eye-tracking

The accumulative count of fixation events that landed within ROIs suggests that larger values correspond to longer total fixation duration (Table 7). The F-test results for the average fixation duration on stimuli and features do not show significant differences: the F-value across stimuli is 1.079 (p-value > .1), and the F-value across feature cues is 1.44 (p-value > .1).

Table 7 Fixation Events Counts within ROIs across stimulus

Feature/group	Control group	Without cues	health cue	popularity cue	with both cues	Total	Average ^a
FAIRTRADE	0	327	133	392	14	866	216.5
Healthy food	0	0	994	0	523	1517	758.5
Organic	773	649	400	208	466	2496	499.2
Best seller	0	0	0	1682	1276	2958	1479
ProductName	1446	752	561	589	295	3643	728.6
Total	2219	1728	2088	2871	2574	11480	
Average ^b	1109.5	576	522	717.75	514.8		

Unit: accumulated counts of fixation point in ROI

^aTotal counts of one feature across groups/number of groups

^bTotal counts of all features one group/number of features

The relative numerical results show that the control group had the longest average fixation rate compared to the treatment groups. This is because the packaging contains fewer features and fewer ROIs to fixate on within the same period. The popularity cue group had the longest total fixation duration and the second longest average fixation duration, with most focus events occurring on the best-seller sticker. This is highly attributed to its central position, vibrant colour, and ample coverage, allowing participants to quickly notice and fixate on it. The product name attracted the most prolonged fixation duration among ROIs due to its prominent display to participants with large, bold lettering, making it noticeable and easy to fixate on. In contrast, the organic logo gained less attention despite being shown for the same duration, as it had smaller coverage and was positioned in the corner. However, the organic label seemed more noticeable than the FAIRTRADE logo, which was the least frequently fixated feature cue. This could be because the vibrant green colour of the organic logo is more eye-catching compared to the dull colour and small size of the FAIRTRADE logo, making it harder to catch people's attention immediately. Healthy food garnered as much attention as the product name despite being positioned less prominently and having a smaller coverage size. This is due to participants' unfamiliarity with the label, which resulted in them fixating more on the feature.

5.5.2 Emotions

The relative average emotional scores across stimuli compare the emotional changes of treatment groups with the control group (Table 8). No mean differences in the emotions across all groups were shown according to one-sample t-tests. However, the relative numeric results show that neutral is the dominating emotion, followed by boredom, anger, and sadness. The health cue group showed the most significant emotional response due to minor boredom and the peak in anger, confusion, and surprise. The popularity cue and with both cues, groups showed more happiness than others.

Table 8 The relative Emotional Score of treatment groups and control group

	Control group	without cues	health cue	popularity cue	with both cues	Average
Test statistics	1.308	.641	.242	.112	.171	-
Neutral	0.83	-0.015	-0.036	-0.029	-0.051	0.797
Bored	0.09	0.001	-0.012	-0.007	-0.006	0.084
Angry	0.036	0.026	0.036	0.023	0.024	0.063
Sad	0.057	-0.002	0.001	-0.013	-0.011	0.051
Confused	0.024	0.002	0.006	0.003	0.004	0.028
Happy	0.001	-0.001	0.001	0.023	0.041	0.017
Interested	0.014	-0.001	0.001	-0.001	-0.002	0.014
Surprised	0.002	0.014	0.016	0.008	0.013	0.015
Disgusted	0.003	-0.001	0.002	0	0.001	0.004
Scared	0.002	-0.001	-0.001	-0.001	0	0.002

p-value: * < .05, ** < .01, *** < .001

The average value of the emotional score of each ROI provides insight into which features contribute to the results of emotional response (Table 9). No mean differences were shown in emotions across all groups according to one-sample t-tests. The numerical results indicate that the FAIRTRADE logo, organic logo and product name received higher scores in "boreome" than the healthy food logo and best-seller sticker, potentially as a result of their frequent exposure

to participants, which made them more accustomed to the labels and less reactive. The FAIRTRADE logo also shows above-average anger, surprise, happiness, low confusion and sadness. The healthy food label shows above-average confusion and less boresome and happiness than other cues. The organic label shows above-average sadness, confusion, low anger, surprise, and happiness. Participants showed high interest, happiness, and low sadness for the best-seller sticker. The product name scored low in anger, surprise, and interest. Scared and disgusted were barely absent, with the same results as the online survey.

Table 9 Average Emotional score within ROIs

	FAIRTRADE	Health	Organic	Best-Seller	Product Name	Average
Test statistics	1.384	1.368	1.326	1.316	1.304	-
Neutral	0.816	0.780	0.813	0.835	0.836	0.816
Bored	0.091	0.070	0.092	0.084	0.091	0.086
Angry	0.088	0.054	0.044	0.054	0.037	0.055
Surprised	0.053	0.021	0.004	0.011	0.007	0.019
Happy	0.022	0.002	0.001	0.015	0.005	0.009
Confused	0.020	0.027	0.030	0.025	0.023	0.025
Sad	0.004	0.076	0.048	0.026	0.036	0.038
Disgusted	0.002	0.002	0.007	0.003	0.008	0.004
Scared	0.001	0.004	0.001	0.003	0.002	0.002
Interested	0.000	0.000	0.010	0.014	0.018	0.008

p-value: * < .05, ** < .01, *** < .001

When comparing FaceReader results to the self-reported emotions from the online questionnaire, there is a difference between implicit and explicit measurements. Besides neutral being the most observed expression with both FaceReader and self-reported expressions, bored and angry are the second and third most observed expressions with FaceReader results. At the same time, interested and happy were selected more with self-reports. The remaining expressions are seldom mentioned by participants, with the absence of fear and disgust. These incongruent results show an expression gap between what participants show and how they think; either participants are holding back or unaware of their true feelings, or the designs are not provoking enough to generate significant facial changes.

5.6. Qualitative responses

The labelled codes for qualitative responses from the online questionnaire cover credential values, functional values, consumption patterns and packaging. Credential codes include fair trade, being environmentally friendly, sustainable, socially just, and reflecting personal ideals. Functional values include price, healthiness, taste, and food safety. Consumption patterns include personal preferences towards (green) tea, the form of tea (tea bags or loose tea), and the brand. Packaging regards the attractiveness and appeal of design, material, transparency, best seller, and natural-like (Table 10).

The most mentioned reason for WTB in treatment groups apart from the health cue group is that the product is fair traded, indicating the producers behind the product care about social justice. For the health cue group, the sustainability and environmental friendliness of the product became the most mentioned reason for WTB. Product preference came next for all treatment groups, showing its significant impact when participants considered purchasing the product. Then, the participants noted the importance of the product's sustainability and environmental friendliness

apart from the health cue groups, to which health was addressed first. WTB for groups without both cues and with both cues, participants mentioned that they seemed to be an ideal product and better option but lacked a more specific description of how the product seemed ideal and better. Reasons for WTB's popularity cue group include aesthetic design and the trustworthiness of the products, which were not mentioned in any other groups.

Table 10 Qualitative codes

Mentioned frequency	without cues	health cue	popularity cue	with both cues
High	Fairtrade and social justice	Sustainable / environmental friendly / Organic	Fairtrade and social justice	Fairtrade and social justice
	I like (the taste of / green) tea	I like (the taste of / green) tea	I like (the taste of / green) tea	I like (the taste of / green) tea
	Sustainable/environmentally friendly/Organic	healthy	Sustainable/environmentally friendly/Organic	Sustainable/environmentally friendly/Organic
	Ideal product/better option	Ideal product/better option	Credential claims are trustworthy	best seller
Low	healthy	Fairtrade and social justice	Aesthetic design	Aesthetic design

6. Discussion

Willingness to buy Sustainable Products

The framework assumed that willingness to buy (WTB) the presented teas, regardless of their packaging, varies with tea consumption frequency (H6). However, findings indicate that tea consumption frequency is not significant for WTB. Instead, whether an individual drinks tea at all is more relevant. Those without a tea-drinking habit are unlikely to consider buying it, regardless of packaging cues. This underscores the importance of product preference in effectively communicating features. When a product fits a person's choice, they evaluate its remaining benefits, making the product features valid. Eye-catching and aesthetic packaging may draw attention, but it does not directly translate into WTB unless the person is already a tea consumer.

The model also assumed that WTB, adjusted for tea usage, is influenced by three sets of sustainability perceptions: biospheric (H1), egoistic (H2), and impure altruistic (H3). Findings show that adding a health cue enhances WTB by appealing to egoistic values, supporting H2. This complements findings by Hamilton and Raison (2019) and Monier-Dilhan (2018), which indicate that combining healthy and organic labels reinforces the positive impact on health and the environment, bolstering trust in the product's credentials.

Impure altruistic perception affects WTB, supporting H2 but not H3. The best-seller sticker is persuasive, indicating popularity and perceived quality, driven by social pressure to conform. This aligns with Griskevicius et al. (2012), who noted people's tendency to copy others unconsciously. However, there is no evidence that consumers associate this with the credential values of social altruism, focusing instead on functional and egoistic benefits.

On the other hand, consumers who value social justice are more willing to buy sustainable products, supporting the human and labour welfare aspect of H1. This is in line with results shown

in previous studies, in which the FAIRTRADE logo effectively communicates support for farmers and social justice (de Groot & Steg, 2008); Steg and De Groot (2012).

Value Structure

The model proposed that impure altruistic perception's effect on WTB is moderated by self-transcendence values (H4b). Participants favouring the FAIRTRADE label reflect a self-transcendence value structure, prioritising pro-environmental beliefs and actions (Collins et al., 2007; De Dominicis et al., 2017; de Groot & Steg, 2008; Steg et al., 2014; Wesley Schultz & Zelezny, 1999). However, this study's best-seller sticker, intended to represent impure altruism, did not evoke social justice values, focusing instead on egoistic values. So we do not find support for H4b.

Similarly, the model also propose self-enhancement moderates the effect of egoistic sustainability perception on WTB (H4a). Health benefits has shown direct appeal to some consumers according to quantitative response, reflecting a potential self-enhancement value structure. However, awareness and knowledge of sustainability and food production are shown critical in sustainable decision-making. Consumers who are more informed about these issues make less emotionally driven decisions, and hence tend to overlook health and best-seller labels, viewing them as mere marketing strategies. So we do not find support for H4a.

Packaging design

Central to the framework is that packaging design can impact WTB by activating specific sustainability perceptions. To further explore these effects, next to a control condition without specific logos, we presented respondents with systematically varied packaging designs which included (or not) a popularity cue, triggering impure altruistic sustainability perception (H5b), and health imagery (or not) potentially triggering egoistic sustainability perception (H5c), as reflected in Figure 2. These were included next to an organic and fairtrade cue on all packaging, potentially triggering biospheric sustainability perception (H5a) compared to when these were absent (in the control group). We find that packaging design is effective in evoking sustainable perceptions. However, there is a lack of evidence showing that a sustainable perception is directly linked to popularity and health cues. Consumers tend to evaluate packaging design as a complete entity rather than focusing on individual features. They often arrive at sustainable solutions after considering all the features together.

Product name, best-seller sticker, and healthy logo indicate functional goals, while packaging material, earth-toned colour, Organic, and FAIRTRADE logos communicate credence values. Combining different cues can lead to varied perceptions. The healthy food logo enhances sustainability's credential value, while the organic logo guarantees functional goals like health and quality. The Organic label raises biospheric perceptions but is associated with higher prices, which can decrease WTB if no other advantages are offered.

Some participants are sceptical of "healthy" and "popular" claims and wary of "greenwashing" tactics. They question the evidence supporting such claims, highlighting the need for balanced feature cues to evoke egoistic perceptions without over-commercializing and compromising reliability.

Explicit and implicit packaging design cues influence consumer opinions. The best-seller sticker is the most attention-catching explicit feature, eliciting strong reactions. The Healthy Food logo captures attention but may cause confusion due to unfamiliarity. The FAIRTRADE logo induces higher anger levels, likely due to its small size and colour, requiring more effort to understand (Lassalle & Itier, 2013; Monier-Dilhan, 2018).

Implicit cues like paper-like packaging and earth-toned colours help recognise natural and sustainable products. Label quantity and packaging shape also impact perception, with some consumers preferring minimalist designs and others favouring more labels. Rectangular packaging shapes suggest tea bags, which can be a discerning point for consumers preferring loose tea.

Table 11 Hypotheses Overview

Hypotheses		Supported
H1	Biospheric perceptions evoke consumers' WTB-sustainable products.	Yes
H2	Egoistic perceptions strengthen consumers' WTB-sustainable products.	No
H3	Impure-social altruistic perceptions strengthen consumers' WTB-sustainable products.	Yes
H4	The effect of perception on WTB-sustainable products is moderated by the value orientation	No
	a. The effect of egoistic perceptions on WTB is stronger for self-enhancement-oriented consumers.	No
	b. The effect of impure altruistic perceptions on WTB-sustainable products is stronger for self-transcendence-oriented consumers.	No
H5	a. Organic and Fairtrade are effective packaging features cues to evoke biospheric perception.	No
	b. Packaging features that cue the product's popularity effectively evoke impure-altruistic perception.	No
	c. Healthy imagery are effective packaging features cues to evoke egoistic perception.	No
H6	Consumption patterns and frequency directly affect consumers' WTB-sustainable products.	Yes

Limitations and Research Direction

Respondent Issues

Most participants in this study were Wageningen University students enrolled in food technology, plant science, nutrition and health, environmental science, and organic agriculture. These students typically have a heightened awareness of sustainability issues due to their coursework, which may have provided them with a deeper understanding of the labels used in the designs. Additionally, students tend to be highly price-conscious due to limited incomes and reliance on subsidies. Therefore, the sample may not fully represent the broader Dutch consumer population, given the participants' unique age, profession, and financial status. Future research should aim to include a more diverse participant group, encompassing various age groups, professions, and demographic backgrounds, to obtain a comprehensive understanding of consumer behaviour.

Product Preference

Product preferences can also affect the accuracy and willingness to evaluate packaging designs. Those less interested in a product tend to make more objective judgments, as the information is less relevant. Addressing consumers' product preferences and price sensitivity is a significant challenge and should be considered in future research, as these factors often impede the encouragement of sustainable purchases.

Measurement Issues in Terms of Scale Items for Constructs

The study faces a limitation in that the variable "Helpful for farmers" only represents social-altruistic aspects, neglecting egoistic motivations. The impure altruism measured is influenced

by the FAIRTRADE logo, which is associated with helping farmers and social justice. Conversely, the "best-seller" sticker aimed to cue impure motivation related to popularity, but this was not effectively captured. Future research should explore how consumers relate to and link feature cues that communicate different benefits.

Packaging Design Prototypes

The packaging design prototypes in this study lack standardization and are developed experimentally. They incorporate necessary elements but do not stand out compared to existing market offerings. Participants found the packaging familiar but not attention-grabbing. Future research should employ standardised procedures for packaging design that align more closely with industrial practices and evoke more accurate reactions. Incorporating more extreme, intense, and unique features may generate vivid reactions, enhancing explicit and implicit emotional measurements.

Consumer Awareness and Education

Exploring ways to increase consumer awareness and education regarding sustainable practices is crucial. Understanding potential methods to make consumers more sensitive to sustainability-related features when purchasing is essential for future studies.

Procedural Issues with Implicit Measures

The eye-tracker used for implicit measurements is very sensitive. Participants were instructed to ensure the green lights indicating successful calibration were always on, requiring them to sit still with their heads at a specific angle and maintain a consistent distance from the screen. This restricted movement and expression, as any strong reaction could necessitate restarting the experiment. Future research should consider these limitations to improve the validity of implicit measurements.

7. Conclusion

The research findings highlight the complex interplay between consumer preferences, sustainable motives conveyed through packaging design, and personal value structures influencing willingness to buy (WTB) sustainable food products. These insights are crucial for enhancing consumer engagement and driving sustainable purchasing behaviours. Although egoism, or the perception of self-benefit, is recognised as the ultimate determining factor in real purchase scenarios—with product preference and price being the foremost priorities according to participant feedback—these observations lack statistical significance. Consequently, whether value structures, consumer awareness, or both have a stronger impact on sustainable behaviour requires further examination.

Effective packaging design for sustainable food products necessitates a deep understanding of consumer preferences, strategic use of sustainable motives, and alignment with consumer value systems. By carefully considering these elements, brands can create packaging solutions that attract attention, motivate sustainable purchasing decisions, and foster long-term consumer loyalty towards sustainable practices. Despite the potential of sustainable packaging to communicate product-related information, its impact on bridging the intention-behaviour gap remains limited. Consumers often prioritise functional goals, such as taste and convenience, over sustainable attributes due to their immediate and tangible benefits. The high psychological distance associated with sustainability, perceived as abstract and future-oriented, further exacerbates this issue. To foster sustainable consumption, it is crucial to make sustainability

personally relevant by incorporating detailed and specific low-level construal messages. This approach can enhance the credibility of sustainable products and align them more closely with consumers' immediate goals and preferences. Future research should focus on developing and testing communication strategies that effectively reduce psychological distance and motivate consumers to prioritise sustainable choices in their everyday purchasing decisions.

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9. Appendix

Pre-Study online survey

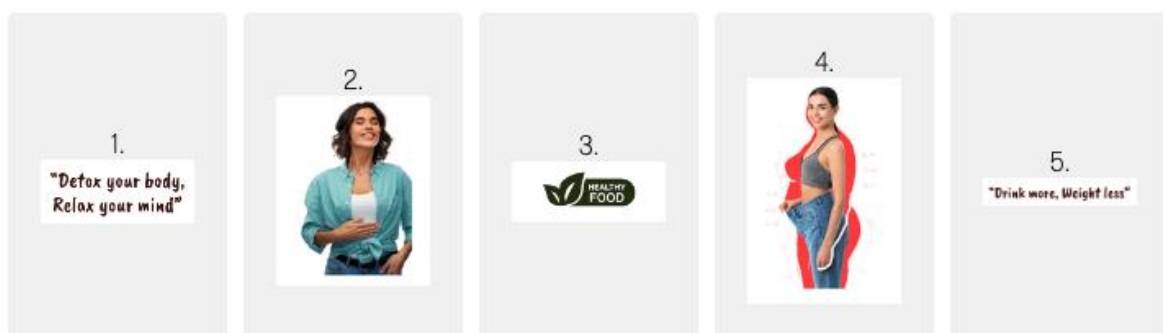
Which of the following features best communicate the **"popularity"** of an organic green tea product?



Which Fairtrade features below most communicate a **kind, generous, or charitable giving feeling**?



Which of the following features do you think best represents the **health benefits** of Organic green tea?



Main study in R

Questionnaire

(1) Measurements of Sustainable Perceptions Towards Design Examples

Biospheric

1. This product is environmentally friendly
2. This product is sustainable.

Impure Altruistic

3. This product is helpful for tea farmers.
4. This product is socially just.

Egoistic

5. This product is healthy.
6. This product benefits my interest.

(2)

(3) Value Orientation measurements

Self-enhancement

1. Social power: control over others, dominance
2. Wealth: material possessions, money
3. Authority: the right to lead or command
4. Influential: having an impact on people and events

Self-Transcendence

5. Equality: equal opportunity for all
6. A world at peace: free of war and conflict
7. Social justice: correcting injustice, caring for the weak
8. Helpful: working for the welfare of others

Biospheric

9. Preventing pollution: protecting natural resources
10. Respecting the earth: harmony with other species
11. Unity with nature: fitting into nature
12. Protecting the environment: preserving nature