FACULTY OF ECONOMICS AND BUSINESS ADMINISTRATION (ICADE)

ARE YOU A SUSTAINABLE PRODUCT? CONSUMERS' CATEGORIZATION OF SUSTAINABLE CONSUMER GOODS

by

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Abstract

The dissertation tackles the urgency for consumers to make eco-conscious choices in their daily lives. The central focus of this thesis revolves around consumer goods, a fundamental element of daily consumption that has substantial consequences for the environmental crisis. Its primary objective is to shed light on the complex process of categorization by which consumers classify products as environmentally friendly, particularly in the absence of a sustainability label. Current literature has identified several iconic cues consumers may incorrectly consider when categorizing a product as green; however, there is missing a systematic explanation of the psychological mechanisms process leading to the use of these cues and the processes whereby these cues influence green categorization and consumer preferences. Against this backdrop, I contend that consumers' lay theories guide the categorization process. Moreover, I defend that lay theories influence decision-making by affecting consumer emotions. A theoretical framework from the literature in different domains, such as concept formation, lay theories, and heuristics is developed. A qualitative study shows that three lay theories (“if it is traditional, then it is green”; “if it reminds me of nature, then it is green”; “if it is from a (perceived) small brand, then it is green”) guide consumers attention to certain cues in green categorization. Finally, focusing specifically on the lay theory ("if it is traditional, then it is green") and throughout an experimental study, I investigate the emotional mechanisms and the conditions under which this lay theory influences greenness categorization and consumer preferences.

I contribute to the sustainable consumption literature by presenting an integrative theoretical framework explaining the processes involved in categorizing products as green, engaging in the conversation about the categorization of green products putting forth a new lens, lay theories, and underscoring the role of emotions in influencing green judgments. The findings are also interpreted in light of Business Ethics and Corporate Social Responsibility literature, discussing how the consumer categorization of products as green has ethical and social responsibility implications for organizations, policy makers, and education institutions.

KEYWORDS: *categorization, environmentally sustainable, lay theories, packaging cues, consumer goods.*

Resumen

La tesis aborda la urgencia de que los consumidores tomen decisiones eco conscientes en su vida cotidiana. El eje central de esta tesis gira en torno a los bienes de consumo, un elemento fundamental del consumo cotidiano que tiene consecuencias sustanciales para la crisis medioambiental. Su principal objetivo es arrojar luz sobre el complejo proceso de categorización por el que los consumidores clasifican los productos como medioambientalmente sostenibles o verdes en ausencia de una etiqueta de sostenibilidad. La bibliografía actual ha identificado varias señales icónicas que los consumidores pueden considerar incorrectamente a la hora de clasificar un producto como medioambientalmente sostenible; sin embargo, falta una explicación sistemática de los mecanismos psicológicos que conducen al uso de estas señales y de los procesos por los que estas señales influyen en la categorización como medioambientalmente sostenible y en las preferencias de los consumidores. En este contexto, sostengo que las teorías legas de los consumidores guían el proceso de categorización. Además, defiendo que las teorías legas influyen en la toma de decisiones al afectar a las emociones del consumidor. Desarrollo un marco teórico a partir de bibliografía en diferentes ámbitos, como la formación de conceptos, las teorías legas y la heurística. A través de un estudio cualitativo muestro que tres teorías legas ("si es tradicional, entonces es verde"; “si me recuerda a la naturaleza, entonces es verde"; "si es de una marca (percibida) pequeña, entonces es verde") guían la atención de los consumidores hacia ciertas señales en la categorización como verde. Por último, centrándome específicamente en la teoría lega (“si es tradicional, entonces es verde”) y a través de un estudio experimental, investigo los mecanismos emocionales y las condiciones en las que esta teoría lega influye en la categorización y las preferencias por lo verde.

Esta tesis contribuye a la literatura sobre consumo sostenible presentando un marco teórico integrador que explica los procesos implicados en la categorización de productos como medioambientalmente sostenibles, participando en la conversación sobre la categorización de productos verdes, proponiendo una nueva lente, las teorías legas, y subrayando el papel de las emociones a la hora de influir en el juicio ecológico. Los resultados también se interpretan a la luz de la literatura sobre ética empresarial y responsabilidad social de las empresas, analizando cómo la categorización de los productos como verdes tiene

implicaciones éticas y de responsabilidad social para las empresas, los responsables políticos y las instituciones de educación.

PALABRAS CLAVE: *categorización, medioambientalmente sostenible, teorías legas, señales en paquetería, bienes de consumo.*

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A note on formatting and style: including publications in this thesis complicates the document's overall formatting. The University of Comillas statute asks that in cases where publications are included in a thesis, that typeface, font size, sub-heading styles, page layout, page numbers, and referencing format remain consistent throughout the document. The presentation of publications varies from their published form in these ways, but the text and structure are otherwise unchanged. This includes the English spelling used in the publications. For readers' convenience, the reference lists are moved and aggregated at the end of the document. Tables and figures have been renumbered to relate to the thesis overall, not the individual publications.

In this dissertation I have not used any artificial intelligence program.

Publication	Publisher	Means of Copyright Permission
Larranaga, A., & Valor, C. (2022). Consumers' categorization of eco-friendly consumer goods: An integrative review and research agenda. *Sustainable Production and Consumption 34 (2022) 518-527* (JCR 2022 Q1) https://https://doi.org/10.1016/j.spc.2022.10.005	Elsevier	Default permission under Author-Publisher Copyright Agreement

Introduction

1. Research topic

Currently, our ecological footprint surpasses the Earth's capacity to sustain the demands we place on its natural resources and ecosystems. By 2030, we will require the resources of two planets to sustain our current lifestyles (Soergel et al., 2021). In this context, consumers influence environmental sustainability through their choices (United Nations, 2020), and we must be aware how our everyday consumption activities affect achieving a more sustainable world by safeguarding the planet's natural resources.

In the last decade, consumers have showed an increased interest in more environmentally friendly consumer products; for example, worldwide sales of green[1] goods reached 215.350 million sales in 2022 (The business research company, 2023). Most of the work on sustainable consumption has explored antecedents of consumer preferences for green products (Costa et al., 2021; El Haffar et al., 2020; Joshi & Kronrod, 2020). This scholarship assumes that consumers can confidently discriminate between more and less environmentally friendly products. Other research shows that although consumers understand what sustainability entails and what type of corporate practices are necessary to improve green performance (Hanss & Böhm, 2012), when they encounter a consumer product, they have a limited ability to assess its environmental footprint (e.g., Steenis et al., 2017).

Past work has shown that indexical cues guide consumers' categorization of products as eco-friendly (Rajagopal & Burnkrant, 2009; Schleenbecker & Hamm, 2013; Thogersen, 2011). Indexical cues provide a verifiable link to a reference point (Grayson & Shulman, 2000), for instance, third-party certifications such as USDA Organic or sustainable claims about the absence of undesirable traits (e.g., paraben-free). However, in the US in 2018, less than 17% of consumer goods had a sustainability-related claim on packaging (Whelan & Kronthal-Sacco, 2019).

In the absence of these indexical cues[2], consistent with cue utilization theory (Richardson et al., 1994), consumers will interpret iconic cues— such as packaging material or brand name—as surrogate sustainability indicators (Steenis et al., 2017). Iconic cues refer to

[1] The terms green, environmentally friendly/sustainable, and eco-friendly will be used as synonymous that indicate product alternatives that minimize any negative impact on the environment.
[2] The terms cue/s and attribute/s will be used interchangeably hereafter

marketing cues that create impressions about the brand's essence (Leigh et al., 2006) but lack an externally verifiable reference point (Mick, 1986).

Current literature presents several iconic cues that may lead consumers to inaccurately categorize consumer products as eco-friendly even when they are not (e.g., Herbes et al., 2020; Pancer et al., 2017; Steenis et al., 2017). However, past scholarship has overlooked the psychological mechanisms that explains why consumers use these cues. An inquiry into the antecedent factors of such categorization becomes then pertinent: understanding the rationale underlying the utilization of particular cues in categorizing a product as green is crucial because it may help design more adequate interventions. We defend that consumers' lay theories guide the categorization process by driving consumers' attention to the presented attributes and their interpretation. Lay theories are people's collective, widely accepted notions or implicit convictions that can impact their perceptual and decision-making faculties (Furnham, 1988).

This thesis focuses on consumer goods: they are pervasive in consumers' lives: they are consumed thrice daily by every individual (Marsh & Bugusu, 2007), and are expected to reach a market of US$8.85 trillion by 2025 (Statista, 2023). In addition, the consumer goods industry is chosen because the role of visual elements is essential for decision-making: as consumers typically follow a low-involvement decision-making process, they rely more on visual cues (Richardson et al., 1994; Silayoi & Speece, 2007). Visuals in consumer goods marketing are essential for creating a solid brand identity, facilitating instant recognition, shaping brand personality, enabling nonverbal communication, and enhancing storytelling (Aaker, 1997; Underwood, 2003). These elements build lasting connections between brands and consumers, ultimately driving purchasing decisions (Aaker, 1997; Underwood, 2003).

2. Research questions

The thesis aims to delve into the intricate realm of consumer behavior and explore several research questions regarding categorizing consumer goods as green. The first research question enquires about the iconic cue's consumers rely on when attempting to categorize a consumer good as green in the absence of indexical cues. Taking stock of scattered

literature in this domain (Lazzarini et al., 2017; Pancer et al., 2017; Steenis et al., 2017; Wood et al., 2018), the objectives of this review are to provide a synthesis of the iconic attributes used as cues of eco-friendliness of past studies, to critically examine the methods and theories used, and to delineate the so-perceived green consumer product.

RQ 1: In the absence of indexical cues, which iconic packaging cues do consumers look to categorize a consumer goods product as green, and how have these cues been studied?

The second research question sheds light on what guides consumers' categorization of goods as green. To address RQ2, I draw from scholarship on concept formation. This research explains how ideas are formed and grouped and how these ideas can be applied to understand the origin of the concept of "greenness." After that, I explore different categorization theories (Loken et al., 2008) and the role of lay theories in categorization.

RQ 2: What guides the green categorization of consumer goods?

The third research question aims to unveil the lay theories held by consumers regarding green consumer products. Lay theories refer to individual´s commonly held notions or implicit beliefs that may influence their perception and decision-making processes (Furnham, 1988). By uncovering these lay theories, academics can comprehensively understand how consumers perceive and interpret green products, policymakers are provided with insights to educate consumers, marketers are supplied with tools to promote effective strategies to communicate green attributes.

RQ 3: What lay theories orient consumer categorization of consumer products as green?

Lastly, whereas the first question focuses on the processes leading to use a particular attribute as a cue of greenness, the fourth research question delves into the psychological mechanisms whereby a particular attribute shapes the perception of greenness and consumer preferences. I focus on one of the lay theories identified in RQ 3, which reads: "If it is traditional, then it is green." In RQ 4, I examine why and when this lay theory operates. I test as mediator the mechanism that drive consumer preferences and greenness categorization and examine the contextual and personal factors that modulate its effects. This understanding is crucial for academics, policymakers, businesses and educational

institutions as it helps them to provide guidelines, encourage good practices, and inform and educate consumers.

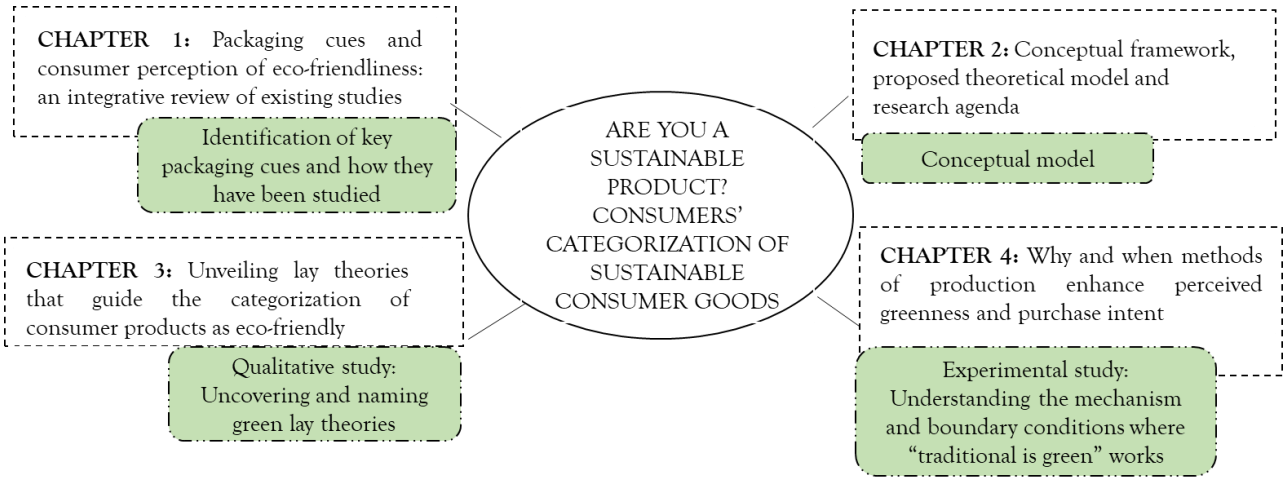
RQ 4: What are the psychological mechanisms through which traditional production methods convey greenness?

In summary, this study seeks to explore the cues consumers rely on to categorize products as green, the guiding factors influencing their categorization, the lay theories they hold, and the mechanisms and conditions under which these beliefs operate. By addressing these research questions, I aim to contribute to the growing body of knowledge surrounding consumer behavior in the context of green products, ultimately assisting consumers, policymakers, organizations and educational institutions in developing educational campaigns, effective marketing strategies, fostering sustainable consumer choices, and avoiding greenwashing.

3. Outline and thesis structure

I address the abovementioned research questions in four chapters. See **Figure 1** for an illustration of the thesis structure explained in turn.

Figure 1: Thesis structure



Chapter 1 presents an integrative literature review that (1) identifies the packaging cues in the consumer goods category that, in the absence of indexical cues or eco-labels, consumers pay attention to; (2) describes how these packaging cues have been studied, which theories explain consumer behaviors, which methods have been employed and in which geographies the research have been conducted. Chapter 1 identified five iconic cues that consumers consider to categorize a product as sustainable: color, imagery, packaging materials, origin, and vendor characteristics and, based on them, feature a green consumer product as a product with earth-colored packaging, nature-evoking imagery, made with a recyclable, biodegradable, and/or reusable material – typically paper or glass-, produced locally and sold by a niche or/and small brand with a round-shaped logo and/or a brand name with silent consonants. Regarding methods, previous research has primarily employed empirical approaches without drawing upon any theoretical frameworks. This atheoretical approach is one of the reasons why past work has not yet provided a comprehensive understanding of the mechanisms underlying green product categorization. While a few studies have attempted to connect individual cues to green assessments, they have merely described how they are associated and considered in overall judgments rather than exploring the cognitive structures or mental frameworks through which consumers interpret these cues. However, such limited explanations do not shed light on why consumers categorize a product as green holistically or elucidate the process of forming the concept of greenness. These gaps are addressed in Chapter 2.

Chapter 2 focuses on comprehending the reasons behind consumers' often inaccurate categorization of green products. To achieve this, I turned my attention to scholarship on concept formation and categorization. Interestingly, I discovered a void in the existing research, with previous scholarly works primarily concentrating on attitudes and preferences concerning sustainable products (Bangsa & Schlegelmilch, 2020; ElHaffar et al., 2020). As a consequence, the psychological mechanisms driving consumer categorization of green products have been overlooked (Gershoff & Frels, 2015). To address this gap, I begin by presenting the theories of concept formation and categorization and their application to comprehend the genesis of the green concept. Subsequently, I delve into lay theories and their role in shaping concept formation and inference functions. Building on these insights, I propose a theoretical framework that is summarized in four

fundamental propositions. Chapter 2 finishes by proposing a research agenda. Some of these suggested lines of inquiry are addressed in chapters 3 and 4.

Chapter 3 unveils and names the lay theories that may explain why consumers pay attention to the observed cues. An interpretive study with 21 in-depth interviews was conducted using a narrative laddering technique (Greenwald et al., 1998; Greenwald et al., 2003). This method allowed us to uncover the consumers' underlying and implicit thought processes when categorizing products as environmentally friendly (Miles & Rowe, 2004; Reynolds & Gutman, 1988). This empirical investigation reveals that attributes conveying traditionality, craftsmanship, and naturalness lead consumers to categorize a product as "green." To illustrate, brand names incorporating words of traditionality contribute to the perception of a brand as smaller and greener.

Chapter 4 focuses on a lay theory unveiled in Chapter 3: "If it is traditional, then it is green." Through an experiment with 280 participants, this study tests the psychological mechanisms by which traditional cues lead to perceived greenness and influence consumer preferences. I propose that traditional cues influence consumer emotions, particularly feelings of groundedness, or the emotional rootedness achieved through a connection to physical, social, and historical aspects (Eichinger et al., 2022). The study also identifies and testes the circumstances under which traditional production cues elicit these perceptions and preferences. Three moderators are examined: category type (vice *vs.* virtue), dispositional nostalgia, and advertising skepticism. To explain the moderating role of these constructs, I draw from two different theories: congruence (Meyers-Levy & Tybout, 1989) and persuasion theories (Petty & Cacioppo, 1984).

The contributions of each study are outlined in each of the four chapters whereas the conclusions section presents the overall practical contributions of this dissertation.

4. Publications and outreach

Chapters 1 and 2 were published as a single paper in the journal *Sustainable Production and Consumption* (JCR 2022 Q1. Impact factor: 8.9). As the outreach of academic research is essential for maximizing the impact of scientific discoveries, promoting knowledge

exchange, and addressing societal challenges (Shanley & López, 2009), I made my research findings accessible and relevant to a broader audience, to the advancement of society as a whole. For this aim, a working paper based on Chapter 1 was presented at the AJICEDE Congress held in December 2021, and once the paper was published, I explained the main findings and implications in Canarias Radio, Radio ECCA, and El Norte de Castilla. A significant moment was the doctoral discussion with doctoral candidates at Nürtingen University (Germany) during an Erasmus teaching stay in April 2023.

The qualitative study (chapter 3) has been presented in three conferences: AEMARK (Sept 2022), RISM2023 Symposium (March 2023), and ACIEK (June 2023), and it is currently under review in the *Journal of Product and Brand Management* (JCR 2022 Q2. Impact factor: 5.2). The experimental study (chapter 4) was presented at the AEMARK Congress (Sept 2023) and will be sent to a JCR-indexed journal before the end of 2023.

5. Contributions

This thesis presents theoretical and practical contributions. Briefly explained, I contribute to the sustainable consumption literature by presenting an integrative theoretical framework explaining the processes involved in categorizing products as green, introducing the role of lay theories, and underscoring the role of emotions in influencing green judgment, practical contributions also extend to several stakeholders: consumer organizations to educate consumers to become more conscious about making green decisions. With these findings, policymakers are urged to educate and create awareness raising campaigns about the meaning of being environmentally friendly and to emphasize the importance of business transparency and regulating marketing strategies (Abutaleb & El-Bassiouny, 2020; Nielsen, 2020). Marketing teams can be trained about packaging cues, how consumers decode them and with this knowledge not involve greenwashing practices. Education institutions in the marketing area are solicited to educate future marketers in sustaining with evidence any communication related to environmental sustainability and acting with ethics.

Chapter 1. Packaging cues and consumer perceptions of eco-friendliness: an integrative review of existing studies

1.1 Introduction

Although consumers understand what sustainability entails and what type of corporate practices are necessary to improve green performance (Hanss & Böhm, 2012), when they encounter a product on a shelf, they cannot assess its greenness. Packaging serves as "the silent salesman" (Sara, 1990) and consumers create specific product impressions based on it. Within packaging, indexical and iconic cues can be differentiated (Ewing et al., 2012). Indexical cues provide a verifiable link to a reference point (Grayson & Shulman, 2000) and have been proven to guide consumers' categorization of eco-friendliness (Hanss & Böhm, 2012). For instance, an eco-label or sustainable claim provides compelling initial evidence of environmental performance so that the product is classified as green. In contrast, iconic cues suggest an ideal fit with expectations without external verifiable reference points (Mick, 1986). For example, consumers cannot verify or contrast a product's greenery by looking at its materials, such as brown paper and string (Ewing et al., 2012). However, most products do not have a sustainable claim; for example, in the US in 2018, only 16.6% of consumer goods products had a sustainability-related claim on packaging (Whelan & Kronthal-Sacco, 2019). Without these indexical cues and consistent with cue utilization theory, consumers will interpret iconic cues as surrogates of sustainability indicators (Steenis et al., 2017). Therefore, this first chapter aims to study past studies to identify which iconic packaging cues have already been found to influence consumers' sustainability assessment. The consumer goods industry is chosen because the role of visual elements is essential for decision-making since consumers typically follow a low-involvement decision-making process they rely more on visual cues (Richardson et al., 1994; Silayoi & Speece, 2007).

For this purpose, an integrative literature review of existing studies is conducted. Integrative reviews are more appropriate when the study aims to synthesize, critique, and offer a revised perspective (Torraco, 2005) as is my case. Once the articles were identified, they were thoroughly analyzed to provide a review of theories, methods, and findings. The structure pursued in this chapter is the following: first, method followed to conduct the literature review is described (section 1.2), review of theories (section 1.3), review of methods (section 1.4), review of findings (section 1.5), summary (section 1.6) and finally a conclusion (section

1.7). In sum, this critique of previous studies would serve as the basis for the new theorization proposed in this dissertation.

1.2 Method

An integrative review of studies examining consumers 'green assessment was conducted (Paul & Criado, 2020; Snyder, 2019). An iterative search approach was implemented (Feldmann & Hamm, 2015) to obtain the largest possible pool of studies. First, Web of Science, Science Direct, and Scopus databases were scanned with an exploratory search string *((packag* and (cue or attribut*) and (sustainab* or organic* or green or eco or environment*))* without any restriction by language, time period or type of document. This search yielded 1,564 records. Titles and abstracts were examined, and documents meeting the inclusion criteria were selected for further analysis. A paper was included if it focused on iconic cues of consumer goods from the consumer lens, and when green assessment or eco-friendliness was the study's outcome variable (thus, excluding studies examining attitudes towards these products, willingness to pay or intention to purchase). Indexical cues such as eco-labels (Eldesouky et al., 2020) or sustainable claims (Lunardo & Saintives, 2013) were out of the scope since past research has already shown that when these cues are present, they guide the categorization process (Ewing et al., 2012). Only 11 papers met the inclusion criteria. The limited number of papers is not surprising given that, as I said, the sustainable categorization of products is an underexamined topic in the literature. Each paper was read in its entirety; the initial analysis showed the packaging-related cues studied; I grouped these cues into five themes: color, imagery, material, origin, and vendor characteristics. To expand the study pool, second-stage searches with other search strings were conducted in the same three databases (see **Table 1** for details).

Table 1. Research strings used in second-stage searches

Color	((packag* color*) and (sustainab* or organic*or green or eco or environment*) and (consum*))
Imagery	((packag* illustrat* or photog*) and (sustainab* or organic*or green or eco or environment*) and (consum*)
Materials	((packag* material*) and (sustainab* or organic*or green or eco or environment*) and (consum*))
Origin	((origin*) and (sustainab* or organic*or green or eco or environment*) and (consum*))
Vendor characteristics	((brand* cue*) and (sustainab* or organic*or green or eco or environment*) and (consum*))

Following the same procedure described above, two more papers were retained. Finally, this initial sample of 13 papers was supplemented with backward citations (Thome-Ortiz, 2016). 13 journal papers referenced by previously identified authors were added**.** This literature review constituted the starting point of this thesis, and it was conducted on 30th December 2021. It has been complemented with five further empirical papers and one literature review paper published in 2022- July 2023. Therefore, what is presented hereafter, comprises 32 papers (34 studies).

Multidisciplinary interest and approach to the topic were reflected in the variety of journals (20) addressing this topic (see **Table 2** for full details).

Table 2. Journal of publication

Journal	**Nº of papers**
Journal of Cleaner Production	6
International Journal of Consumer Studies	3
Food quality and preference	3
Sustainability	3
Packaging Technology and Science	2
Environmental Management	1
International Journal of Retail & Distribution Manufacturing	1
International Journal of Food and Science	1
Journal of Advertising	1
Journal of Advertising Research	1
Journal of Business Ethics	1
Journal of the Community Development Society	1
Journal of Consumer Marketing	1
Journal of Consumer Psychology	1
Journal of Rural Studies	1
Marketing Letters	1
Psychology and Marketing	1
Renewable Agriculture and Food Systems	1
Resources, Conservation & Recycling	1
Foods	1

Two thirds of the papers (22 out of 32) have been published in the last seven years, showing an increasing interest in the topic (see **Figure 2**).

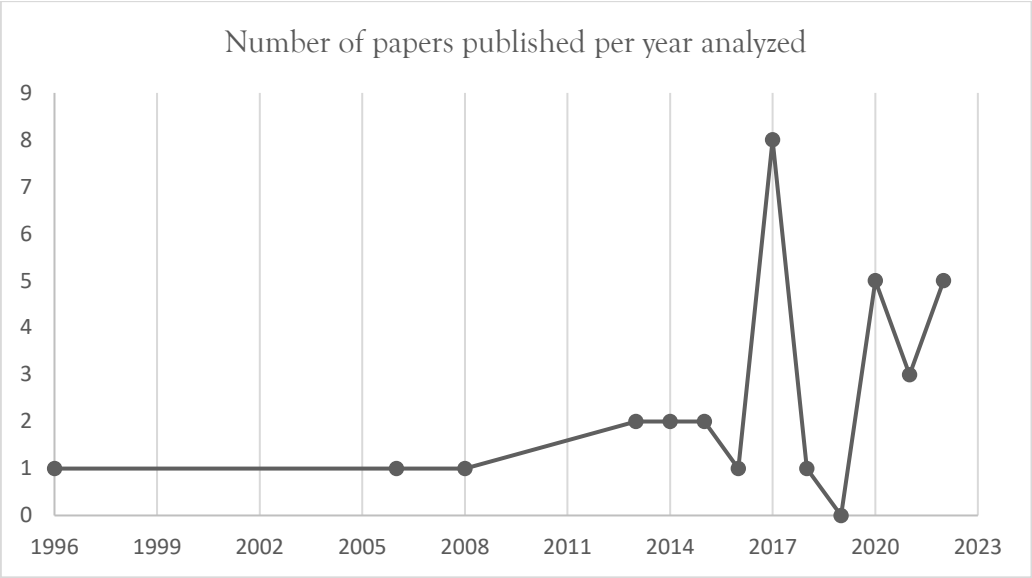


Figure 2. Number of papers published per year analyzed

Most of the studies focused on a particular product, be it food-beverages (16), cleaning-beauty (8); 7 studies examined a generic consumer product (i.e., food in general). Regarding geographies, North America and Europe were the two regions concentrating most of the studies: North America (14), Europe (13), and North America and Europe combined (3). The remaining were in Asia (3) and Africa (1).

1.3 Review of theories

This section gives an overview of the main theoretical foundations upon which the 34 studies on green assessment were based. Seventeen studies are merely empirical and not based upon any theory. **Table 3** captures if an empirical study is based on theory or not. Moreover, I show theories found in a figure with two axes. One axe describes "what" product attributes consumers to look to make the overall judgment, and the other axe unfolds "how" consumers look at these cues to make a general judgment. **Figure 3** captures the model comprising the theoretical foundations of the studies and further I explain the theories.

Table 3. Classification of studies

Authors	Year	Theoretical foundation
Autio et al.	2013	No theory
Bazzani & Cannavari	2017	No theory
Carroll & Fahy	2015	No theory
De Feo et al.	2022	No theory
Herbes et al.	2018	No theory
Herbes et al.	2020	Cue utilization
Herrmann et al.	2022	No theory
Joshi & Kronrod. S1	2020	Sound symbolism. Metaphor cognition.
Joshi & Kronrod. S4		
Lazzarini et al.	2017	No theory
Liem et al.	2022	No theory
Lindh et al.	2016	No theory
Magnier & Crié S1	2015	No theory
Magnier & Crié S2	2015	No theory
Magnier & Schoormans	2017	Inference
Meiting & Hua. S1	2021	Shape symbolism
Meiting & Hua. S2		
Merlino et al.	2022	No theory
Norton et al.	2022	No theory
Nguyen et al.	2020	No theory
Ostrom	2006	No theory
Pancer et al. S2	2017	Cue utilization. Inference.
Pancer et al. S3	2017	
Samaraweera et al. S2	2021	Color and images symbolism
Scekic & Krishna. S1	2021	Metaphorical associations. Inferences
Scekic & Krishna. S2		
Scekic & Krishna. S3		
Scekic & Krishna. S4		
Scott & Vigar-Ellis	2014	No theory
Seo & Scammon. S1	2017	Conceptual fluency
Seo & Scammon. S2		
Smithers et al.	2008	No theory
Steenis et al.	2017	Cue utilization. Inferences
Wood et al. S1	2018	Zero-sum thinking

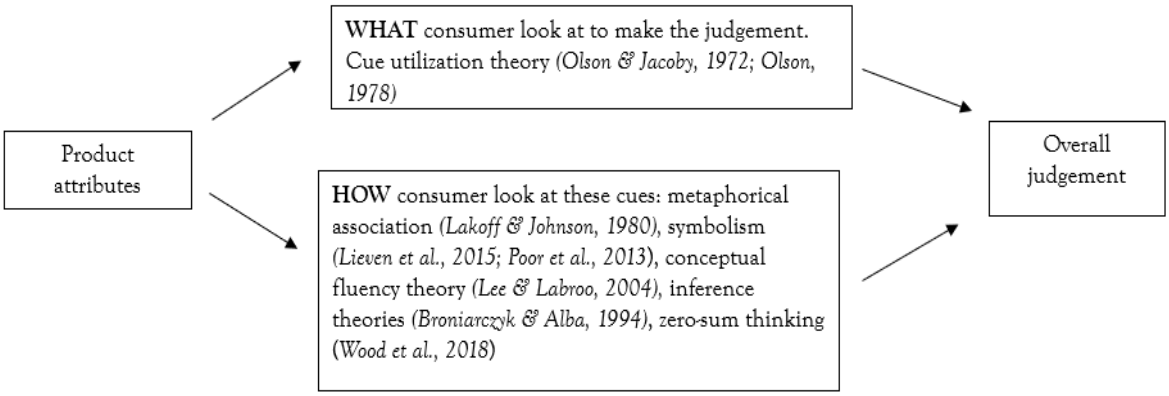


Figure 3. Theoretical foundations of the studies

"What" do consumers look at to make the judgment. To explain the "what," cue utilization theory (Olson & Jacoby, 1972; Olson, 1978) has been used. According to this theory, a product is a bundle of cues indicating specific product attributes. Consumers ascertain and evaluate these cues (i.e., material or symbolic: color, logo shape, brand name) based on the cues' predictive and confidence values (Olson & Jacoby, 1972). The predictive value of a cue is the degree to which a sign is perceived to be associated with specific benefits (i.e., environmentally friendly or tasty). In contrast, the confidence value is the degree to which consumers are confident in making accurate judgments based on these available cues. Once the cues have been attended to and interpreted by consumers as "cue perceptions", then, inferences follow so that consumers form a judgment of the product (Olson, 1978) such as their eco-friendliness.

Four studies explicitly refer to cue utilization theory (see **Table 3**); however, in one of them, theory is mentioned, but the hypotheses are not deductively based on it (Herbes et al., 2020), whereas in the other three (Pancer et al., 2017 S2, S3; Steenis et al., 2017) research questions are elaborated based on the theory. The remaining studies, which are the majority (13), draw implicitly on cue utilization theory and focus their investigation on theories regarding "how".

"How" consumers look at these cues. To explain "how" consumers look at cues, different theories have been used, namely metaphor associations (Lakoff & Johnson, 1980), symbolism theories (Guevremont & Grohmann, 2015; Klink, 2001; Labrecque & Milne,

2013), conceptual fluency theories (Lee & Labroo, 2004), inference theories (Broniarczyk & Alba, 1994; Loken et al., 2008) and zero-sum thinking (Von Neumann, 1953). Each of them is briefly explained in turn.

Metaphor associations theory (Lakoff & Johnson, 1980) describes how humans naturally associate meanings embedded in our mind, with an intended meaning about objects to make an overall judgment of them. For example, a feminine brand personality relates to environmental friendliness suggesting femininity will drive perceptions of greenness (Joshi & Kronrod, 2020). Specifically, silent consonants in brand names evoke feminine characteristics (i.e., caring, ethical, concerned) and thus are more effective at conveying environmental friendliness, which involves caring, because they are metaphorically associated with a feminine brand personality (Joshi & Kronrod, 2020).

Close to metaphor theory is symbolism theory. According to this theory consumers use cues (i.e., sounds, colors, images, logo shape) as symbols when making a judgment. For example, sound symbolism (Klink, 2001) shows the ability of sounds to convey meaning in metaphorical contexts that are later used to make an overall judgment (i.e., the embedding sounds of individual letters or combinations of letters in the brand name convey meaning to recipients); similarly, color symbolism (Labrecque & Milne, 2013) evidences that consumers use color attributes inherent to the *stimulus* itself to produce automatically physiological responses (i.e., red activates arousal). The same can be said for image symbolism (Poor et al., 2013), where images also affect overall judgment, or shape symbolism (Guevremont & Grohmann, 2015) where the physical shape of an object also drives the perception of psychological characteristics of it. To illustrate, the form of green brand logos might influence consumers' green perception by mediating feminine stereotyping. Women are stereotypically thought to be warmer than men, and due to this, feminine attributes are considered more appropriate for green brands as they convey careness (Meiting & Hua, 2021; Slepian & Galinsky, 2016). Therefore, the association between a rounded shape and greenness might intrinsically exist in human intuition (Meiting & Hua, 2021). To conclude, consumers use metaphors and symbols in their interpretation of product cues to make their overall judgment.

In this interpretation, conceptual fluency theory (Lee & Labroo, 2004) highlights the relevance of the ease with which the meaning of information comes to mind. The more

fluent the salience attribute is with the green concept we have in our mind, the more easily it will be to interpret the cue. For instance, conceptual fluency can be achieved by priming people with a conceptually related construct, which can lead to more favorable evaluations of the subsequently presented target construct. In this case, a green packaging would be more conceptually fluent with the notion eco-friendliness; thus, because of its conceptual fluency, a judgment of eco-friendliness would come more easily to consumers' minds.

Complementing these arguments, inference theory (Broniarczyk & Alba, 1994) demonstrates that it is optional to have complete information because consumers make inferences from the information available to make the overall judgment. More in detail, inference theory explains how consumers "fill in" missing information about a product attribute by relying on specific product attributes to evaluate (Broniarczyk & Alba, 1994). Based on packaging cues, consumers infer if a product is more or less green by activating an environmentally-related schema they have in mind and making inferences about missing attributes. These inferences could be based on inter-attribute correlations, where information about one variable enables consumers to draw inferences about the other attributes (i.e., price and quality) or implicit theories about categories to draw inferences about products (Loken et al., 2008). Category-based inference consists of comparing the features of a target object to the characteristics of a category prototype seeing the similarity. If a good match or overlap exists, the object is assigned to the category (Loken et al., 2008).

Finally, the theory of zero-sum thinking (Von Neumann, 1953) has been applied to explain how consumers resolve tensions between product performance delivery and being green (Luchs et al., 2010). Applying this to a business, consumer believe that performance and greenness compete for resources and companies have to choose one or the other. For example, if a hand-sanitizer has a greenness claim, consumers believe it is less strong in terms of performance (Wood et al., 2018).

In sum, theories studying the "how" relate to fluency process, the source of fluency can be metaphor or symbols acquired through experience.

1.4 Review of methods

My dependent variable, green assessment, has been studied through quantitative methods, mainly experiments (16) and surveys (6). Also, interpretive methods (5), mixed-method (1), and free-choice profiling (1) have been applied. Each method's details are explained in turn.

1.4.1 Experiments

The green assessment was measured with items similar in essence and captured in **Table 4.** Most studies (13 out of 16) measured green assessment with only one item, making the reliability weaker. In four studies, more than one item is used (Joshi & Kronrod, 2020; Magnier & Schoormans, 2017; Pancer et al., 2017). Moreover, in one study (Lazzarini et al., 2017) consumer phenomenological assessment of greenness was contrasted with objective assessment using Life Cycle Assessment (LCA).

All the experiments used Likert seven-point scales (from "1: definitely not" to "7: definitely yes"), except three of them where a more sensitive scale was employed (1-100); (Lazzarini et al., 2017; Pancer et al., 2017). Moreover, one study used (Scekic & Krishna, 2021) Implicit Association Test (IAT) and participants had to assign words to "natural product or small company" or "artificial product or big company" categories. Two blocks were presented: one congruent and another one where categories were paired oppositely (incongruent).

Experiments manipulate packaging cues and test the impact of packaging cues on perceptions of product greenness: color and materials were used in 9 studies, respectively, vendor characteristics in 4 and origin in 3 studies. Most of the papers manipulate a single cue at a time. Two papers (Magnier & Schoormans, 2017; Samaraweera et al., 2021) examined a combination of two cues. Whereas Steenis et al. (2017) evaluated two cues in the same experiment; they did it separately and not considering the interaction between them. Manipulated cues details are summarized in **Table 4**. Manipulation check is only found in three studies within the same paper (Scekic & Krishna, 2021). The rest of the experiments, this quality check would need to be performed and reported; otherwise it could compromise the quality of the findings.

Only in two studies were mediator variables analyzed Meiting & Hua (2021 S1, S2) concluded that the shape of brand logos does affects consumers' green perception through the multiple mediation effects of gender perception and warm perception. Seo & Scammon (2017, S1) determined that conceptual fluency mediated the relationship between colors and environmental perceptions. They also tested other mediators (color effect, color preference, mood) and were not significant.

The categories studied were quite varied, from packed food (9), not specified (7), household cleaning (4), beauty (4), fresh food (2), and others (2). In five studies, a fictitious brand was used; three studies were based on real brands, and in most papers, the brand is not specified. Five papers replicated the findings in multiple categories, whereas the other four focused on a single category. Overall, results are consistent across categories.

Experiments were conducted mainly with students (10 out of 16); the remaining six were conducted with convenience samples. Only one experiment (Meiting & Hua, 2021) was replicated with students and consumers; no differences were observed. As generally known, students as a sample may not accurately represent the characteristics of the population, and sampling error cannot be estimated (Creswell & Creswell, 2017). Sample sizes varied from 140 to 565 participants.

With regards to geographies**,** studies have been conducted mainly in OCDE countries: USA (11 out of 16), Europe (3) and Canada (1), and one in China, but results are consistent across countries, which do not suggest cultural effects.

Table 4. Description of experiments

Authors	Year	Cue manipulated	Manipulation details	Nº Items, item description and scale	Sample size and description	Product type	A real or fictitious brand
Joshi & Kronrod. S1	2020	Brand name	Two pens with fictitious brand names (Jobeza *vs.* Sekato; silent/no silent consonants) were presented, and participants rated statements	1 item: "The brand name sounds eco-friendly." Likert 1-7	200 students (US). Library of a large Midwestern university.	Pen	Fictitious
Joshi & Kronrod. S4		Brand name	Two fictitious brand names (Etopal and Edopal), based on existing names in the market.	4 items: "The product is environmentally friendly; "The product can reduce environmental impact compared to other similar products,"; "This product is eco-friendlier,"; "The product is harmful to the environment." Likert 1-7	210 M-Turk (US)	Sunscreen	Fictitious
Lazzarini et al.	2017	Season, label, country (origin)	2 (season) x 2 (label) x 3 (country)	1 item: "Perceived environmental sustainability." Scale 0-100. LCA	305 consumers (Switzerland)	Bell peppers	Category level. No brand names
		Label, country (origin)	2 (label) x 3 (country)			Apples	
		Country (origin), organic label, fair trade	2 (country) x 2 (organic label: yes/no) x 2 (fair-trade label:yes/no)			Coffee	

Authors	Year	Cue manipulated	Manipulation details	Nº Items, item description and scale	Sample size and description	Product type	A real or fictitious brand
Magnier & Schoormans	2017	Color Packaging materials and label	3 (packaging style elements: red hard plastic *vs.* white hard plastic *vs.* fiber-based material) × 2 (an environmental claim about the package: absence *vs.* presence)	2 items:" This packaging is eco-friendly"; "This is a good example of environmentally friendly packaging." Likert 1-7	207 consumers responsible for grocery shopping (Holland)	Laundry detergent	Fictitious
Meiting & Hua. S1	2021	Brand logo shape	Rounded or angular	1 item: "Brand logo that fits better for the generic or green brand." Likert 1-7	156 students (China)	No specific product or brand. Virtual brand logos	Not specified
Meiting & Hua. S2		Brand logo shape	Rounded or angular	1 item: "Green perception of the brand logos. Likert 1-7	214 consumers from Sojump (similar to MTurk) (China)		
Pancer et al. S2	2017	Color, explanation	Color (Orange *vs.* Green) and Justification for Color (None *vs.* Scent)	4 items: "Product as environmentally friendly." "Committed to making the environment better." "More environmentally friendly than similar products." " Less harmful to the environment than other similar products" Scale 1 to 100	140 students (Canada)	Dish soap	Real-Dawn

Authors	Year	Cue manipulated	Manipulation details	Nº Items, item description and scale	Sample size and description	Product type	A real or fictitious brand
Pancer et al. S3	2017	Color, label	Color: Control (purple) *vs.* Non-Green (grey) *vs.* Green) x Product Label (No Label *vs.* Fairtrade *vs.* Eco-label)	1 item: "Product as environmentally friendly." Scale 1-100	273 M-Turkers (US)	Toothpaste	Real-Colgate
Samaraweera et al. S2	2021	Color	Color (no color/white-toned label *vs* green-toned label) x Nature Images (no image *vs* flower *vs* leaf)	1 item: "Environmentally-friendly product". Likert 1-7	268 consumers responsible for grocery shopping (US)	All purpose cleaner	Not specified
		Imagery					
Scekic & Krishna. S1	2021	Company size, salience	Firm size (small *vs.* large) x salience (high *vs.* low)	1 item: "How natural they thought organic and conventionally grown cotton were". Likert 1-7	182 students (US)	Towels	Not specified
Scekic & Krishna. S2		Company size	Firm size (small *vs.* large) x salience (high *vs.* low)	1 item: "Perceived naturalness". Likert 1-7	287 students (US)	Liquid hand soap	Not specified

Authors	Year	Cue manipulated	Manipulation details	Nº Items, item description and scale	Sample size and description	Product type	A real or fictitious brand
Scekic & Krishna. S3	2017	Company size, natural/artificial	"Congruent" block: "natural product or small company," or the "artificial product or big company" categories. "Incongruent" block, the categories were paired in the opposite way	1 item: "Company size (big/small) and natural/artificial." Need to pair it. IAT (Implicit Association Test)	290 students (US)	No product	Not applicable
Scekic & Krishna. S4		Company size	Firm size: small, large, no mentioned	1 item: "Perceived naturalness". Likert 1-7	252 students (US)	Hand cream	Not specified
Seo & Scammon. S1		Color	Color (green, red, blue, yellow, and grey)	1 item: "How environmentally friendly the brand was compared to other similar brands", Likert 1-7	138 students (US)	Fictitious new product	Fictitious
Seo & Scammon. S2		Color, claim	Color (green *vs.* red package) × Salience (environmental claim *vs.* no claim)	1 item: "How positive or negative the brand's environmental impact was and how environmentally friendly the brand was". Likert 1-7	162 students (US)	Fictitious brand energy drink	Fictitious

Authors	Year	Cue manipulated	Manipulation details	Nº Items, item description and scale	Sample size and description	Product type	A real or fictitious brand
Wood et al. S1	2018	Brand size, green cues	Brands (target, niche competitor, mainstream competitor) x conditions (no cue, green cue, safety cue).	1 item: "Environmental friendliness". Likert 1-7.	565 pesticides users (US)	Home pesticides	Real- but name not stated

1.4.2 Correlational studies

The nine correlational studies measured the green assessment with open-ended and closed-ended questions. This combination presents an advantage, as participants can express their thoughts in their own words, and simultaneously a standard scale explores differences in sociodemographic characteristics. **Table 5** depicts the open-ended questions posed. For example, regarding packaging materials, Lindh et al. (2016) questioned what consumers perceive to be environmentally sustainable packaging.

Most of the surveys were conducted online (5) except 4, where one was carried out via phone (Ostrom, 2006), two face-to-face (Smithers et al., 2008) and one more combined face-to-face and online techniques (Herbes et al., 2020).

Similar to experiments, single cues were analyzed; moreover, fewer cues have been studied in surveys, namely origin (3) and materials (6), and two studies explored two packaging cues (color and materials) (Herbes et al., 2020; Scott & Vigar-Ellis, 2014) however not in interaction. Food was the category where most of the surveys focused (6). In the three remaining studies, the category type is not specified.

In contrast with experiments, survey participants were nearly always consumers responsible for groceries (5), whereas, in 1 study, they were general population (Scott & Vigar-Ellis, 2014). Sample sizes ranged from 157 to 5352 participants.

Although most studies focus on a single geographical region (refer to **Table 5**), two multi-country studies–including North American and European countries–were conducted; these studies have unveiled some commonalities and some differences across geographies. For instance, for Germans, French, and North American consumers, packaging materials that are recyclable, biodegradable, and reusable are perceived sustainable. French consumers rely more on packaging color and material to categorize products as sustainable, whereas Germans and Americans rely more on package claims and additional product searches (Herbes et al., 2020).

Table 5. Description of correlational studies

Authors	Year	Attributes analyzed	Type of survey and types of questions	Main topics/Research questions	Sample size and description	Product type
De Feo et al.,	2022	Packaging materials	Online survey. Open-ended questions	Questions about the importance of sustainability and the perceived sustainability for each packaging alternative.	5352 Students from an Italian University who buys soft drinks	Soft drinks
Herbes et al.	2018	Packaging materials	Online survey. Open-ended and closed-ended questions	1. How do consumers rate different packaging materials regarding environmental friendliness and why? 2. Would consumers accept a packaging solution based on biomethane? 3. Which reservations do consumers have about packaging solutions based on biomethane? 4. What cross-cultural differences between consumers in France, Germany, and the United States can be observed?	2001 people grocery responsible. Germany (948), France (443), U.S. (610)	Not specific product.
Herbes et al.	2020	Packaging color Packaging materials	Online and face-to-face survey. Open and close-ended questions.	1. What cues do consumers in three large market countries—France, Germany, and the US—use to assess the environmental merit of a packaging option? 2. How do consumer assessments compare across these countries in, for example, the priorities assigned to packaging cues? 3. Are consumers given enough information to make sound decisions about the environmental impact of the packaging they choose?	3127 consumers responsible for grocery shopping. Germany (2064), France (453), U.S. (610)	Not specific product.
Lindh et al.	2016	Packaging materials	Online survey. Open-ended and closed-ended questions	What do consumers perceive to be environmentally sustainable packaging?	157 consumers (Sweden)	Food in general
Merlino et al.	2022	Origin	Face-to-face survey Close-ended questions	Local production perception. Indicate three words (out of 13) that define, in your opinion, the local production of Fruit &Vegs How much do you agree with the following statements regarding local production? (1-7 Likert)	500 consumers of large-scale retail trade and local markets (North-West Italy).	Fruit and vegetables
Norton et al.	2022	Packaging materials	On-line survey Close-ended questions	Determining key sustainable packaging attributes when no information is provided	405 consumers. UK	Food in general

Authors	Year	Attributes analyzed	Type of survey and types of questions	Main topics/Research questions	Sample size and description	Product type
Ostrom	2006	Origin	Telephone survey. Open-ended and closed-ended questions	What does locally grow or produced food mean to you?	950 consumers (US)	Food
Scott & Vigar-Ellis	2014	Packaging color Packaging materials	Online survey. Open-ended and closed-ended questions	Assessed respondents' understanding of the term 'environmentally friendly' packaging, frequency of involvement in activities such as recycling and reusing packaging, and the perceived benefits of environmentally friendly packaging.	323 general population (South Africa). Facebook as the sampling frame	Not specific product.
Smithers et al.	2008	Origin	Face-to-face survey. Open-ended and closed-ended questions	Five main areas: 1) purchasing habits, 2) motivations for attendance, 3) beliefs and the basis of choices concerning Food at the market, 4) beliefs and strategies concerning food vendors, and 5) future prospects of farmers to link producer and consumer interests.	237 consumers interviewed at farmers' markets (Canada)	Food

1.4.3 Interpretive methods

A broader and complementary understanding of the two previous quantitative methods was obtained through interpretative approaches that inductively infer the attributes or cues used by consumers to assess the greenness of products. **Table 6** contains the details per study. To gain this understanding, four used in-depth interviews (Autio et al., 2013; Bazzani & Canavari, 2017; Carroll & Fahy, 2015; Magnier & Crié, 2015), one Zaltman Metaphor Elicitation Technique (Magnier & Crié, 2015 S2) and another one focus groups (Nguyen et al., 2020). Again, most of the studies (3) only discussed one packaging cue at a time: origin (2) and materials (1), whereas two studies within the same paper (Magnier & Crié, 2015 S1, S2) handled the combination and interaction of three packaging cues: color, imagery, and materials.

Most studies were conducted in Europe (4) and 1 in Asia (Vietnam). Participants from all the studies were consumers, and the categories discussed were food in general (2), consumer goods (2), and one specific category (instant noodles). They followed a convenience and non-probabilistic sample.

Table 6. Description of interpretative methods

Authors	Year	Attributes studied	Method details	Main topics address	Sample description	Product Type
Autio et al.	2013	Origin	In-depth interviews	What does the 'locality' of food mean for Finnish consumers? What kind of cultural meanings do local foods represent for Finns	22 consumers (Finland)	Food products
Bazzani & Cannavari	2017	Origin	In-depth interviews	The importance of the origin of food products and attitudes toward Geographical Indications	23 consumers participants in Farmer's Markets: 6 consumers; 8 farmers; 9 experts (Italy)	Food products
Magnier & Crié S1	2015	Packaging color, imagery, and materials	In-depth interviews	Apprehend consumers' responses triggered by the perception of ecological packaging cues	8 consumers responsible for grocery shopping (France)	Consumer goods
Magnier & Crié S2			In-depth interviews Zaltman Metaphor Elicitation Technique	Participants bring between eight and 12 images that represented ecological packaging in their eyes	10 consumers responsible for grocery shopping (France)	
Nguyen et al.	2020	Packaging materials	6 focus groups	Consumers' perceptions and expectations of eco-friendly packaging	36 buyers of instant noodles (Vietnam)	Instant noodles

1.4.4 Mixed methods

Three papers used a mixed method. Carroll & Fahy (2015) conducted a survey (n=1000), focus groups (n=42), and in-depth interviews (n=28) to study how participants understood the term 'local food' and its relationship with sustainability in Ireland. Herrmann et al. (2022) conducted a discrete choice experiment and qualitative free-text analysis to analyze consumers' sustainability-related perception of and willingness to pay for alternative food packaging (unpackaged, paper, recycled plastic, bioplastic). Liem et al. (2022) conducted four focus groups where participants did a free association task and sorting task with ten milk package designs that differed in color, material, and shape, and a quantitative study (n=104) via an online experiment where they manipulated color (white *vs.* cardboard brown) and materials (smooth *vs.* rough).

1.4.5 Free choice profiling

One paper (Steenis et al., 2017) used free choice profiling, allowing participants to describe the *stimulus* in their own words and assessing different variables, although I focus only on sustainability assessment. As for the *stimuli*, they studied imagery and materials with a real tomato soup brand with 249 students in Holland.

1.5 Review of findings

Based on the results of the sampled studies, the first conclusion is that five iconic cues have received much attention in past studies, and results are coincident across methods and countries. Each cue's findings are explained in turn. And specific findings per study are exhibited in **Table 7** at the end of this section.

1.5.1 Packaging color

Consistent findings across methods (experiments, surveys, and interpretivist approach) and countries (from the US to different European countries and South Africa) lead to conclude that earth-colored packaging (i.e., green or brown) is perceived as eco-friendlier than products with bright-colored packaging's (i.e., red) (Herbes et al., 2020; Ketelsen et al.,

2020; Magnier & Schoormans, 2017; Pancer et al., 2017; Samaraweera et al., 2021; Scott & Vigar-Ellis, 2014; Seo & Scammon, 2017). This is driven by the fact that universally 'earth' colors symbolize nature and therefore activate impressions of sustainability (Labrecque & Milne, 2013). In contrast, bright colors (i.e., red) evoke strength and inferences of strength correlate negatively with sustainability perceptions (Magnier & Schoormans, 2017).

Moreover, recent studies (Samaraweera et al., 2021) comparing different earth colors (green and white) conclude that white packaging is perceived as more sustainable than green packaging. Drawing on symbolism's theories (Zhu & Meyers-Levy, 2005) white-colored labels on packaging convey better the greenness of products than green-colored labels. The authors went beyond and examined the *stimulus* of Pancer et al. (2017) and Seo & Scammon (2017) studies. In both studies, white color label, packaging was not included as a predominant color when assessing the effectiveness of the color green, which might explain the different results. In sum, color the green might perform better than grey/red but is less able to convey greenness when compared to white.

1.5.2 Packaging imagery

Imagery comprises images and photographs. Nature-evoking imagery on the packaging is a cue of eco-friendliness (Magnier & Crié, 2015; Scott & Vigar-Ellis, 2014; Steenis et al., 2017). However, contrary to previous results, Samaraweera et al. (2021) concluded that although nature pictures boosted aesthetic appeal, consumers did not interpret these images as a sustainability cue. In their study they used no image *vs.* flower *vs.* leaves as *stimuli*, whereas previous authors have not included "no image" and this might explain why Samaraweera et al. (2021) findings nuance previous research (Samaraweera et al., 2021).

1.5.3 Packaging material

This is one of the fundamental cues' consumers use to categorize a product as sustainable (Van Dam, 1996), since consumers almost exclusively refer to the packaging material when it comes to their perceptions of the environmental impact of packaging (Van Dam, 1996). Moreover, packaging materials shape greenness perceptions and judgments of taste and quality (Steenis et al., 2017).

Although each study was based on different material types, and heterogenous methods were used, some robust conclusions can be extracted. Findings revealed that plastic and metal are usually categorized as less sustainable (Herbes et al., 2018; Ketelsen et al., 2020; Lindh et al., 2016; Magnier & Crié, 2015; Steenis et al., 2017) and paper and glass as the most sustainable materials (De Feo et al., 2022; Herrmann et al., 2022; Lindh et al., 2016; Steenis et al., 2017).

When the consumers' green assessment is compared with the objective environmental performance of these materials, using Life Cycle Assessment (LCA) (Van Dam, 1996), it results that consumers seem to overemphasize a portion of materials' environmental impacts (recyclability, biodegradability, and reuse rate), while disregarding the first stages of the life cycle (Liem et al., 2022; Norton et al., 2022). To illustrate, consumers believe glass is one of the most sustainable materials, whereas the LCA shows the opposite.

Some differences were observed across countries. Herbes et al. (2018), in their multicountry study, concluded that Germans take more into account the material itself (and the associated environmental impacts) to make a green assessment *vs.* French and North Americans.

1.5.4 Origin

For consumers, origin encompasses mainly production location (local, regional, national, overseas) and country of origin (Feldmann & Hamm, 2015). However, local seems to be phenomenologically assessed by consumers, and a standardized label does not exist certifying local food (Feldmann & Hamm, 2015). Nevertheless, the most frequently objective measure of localness is based on production-to-consumer distance (i.e., miles or kilometers) or on political boundaries (i.e., states, provinces, countries) (Feldmann & Hamm, 2015). However, other studies show that consumers usually conflate lesser physical distance with sustainability (Merle et al., 2016).

Many studies have shown that consumers believe that locally-grown products are more sustainable (Feldmann & Hamm, 2015; Lazzarini et al., 2017). For this, goods produced closer to the consumer are perceived as eco-friendlier. Notwithstanding, products made using traditional, "crafty," manual, or non-industrial methods or emphasizing "freshness" and "naturalness" (i.e., pesticide-free) (Autio et al., 2013; Bazzani & Canavari, 2017;

Carroll & Fahy, 2015; Granvik et al., 2017; Lazzarini et al., 2017; Ostrom, 2006; Smithers et al., 2008; Thome-Ortiz, 2016) are also perceived as more sustainable, even when they are produced further away.

This is partly in line with findings of LCA studies: local food products are more environmentally friendly than imported products, mainly due to the transport mode and distance (Jungbluth et al., 2000; Stoessel et al., 2012). However, choosing local produce is insufficient to ensure the consumed foods' low environmental impacts, as product category (Jungbluth et al., 2000) seasonality and farming system (Meier et al., 2015; Nemecek et al., 2011) highly affect foods' environmental sustainability. For instance, domestic vegetables and fruits are only the most environmentally friendly option when they are in season and produced using sustainable production systems. Lazzarini et al. (2017) assumed that consumers reached this conclusion based on the 'our own country is best' heuristic which it can also result in making systematic mistakes in product sustainability assessment.

1.5.5 Vendor characteristics

Brand size, brand visual (shape of brand logos), and auditory features (brand names) have been examined in past studies. Regarding brand size, niche or/and small brands with a green product portfolio are perceived as more sustainable (Scekic & Krishna, 2021; Wood et al., 2018) than large corporations. This perception is said to be driven by two elements. First, the lay belief some consumers hold that big companies cannot deliver sustainability commitments to the same extent as small businesses (Wood et al., 2018). Second, the zero-sum thinking about product's efficacy trade-off, which is a vestige in green-washing (Nyilasy et al., 2014; Wood et al., 2018). Zero-sum thinking explains that consumers weigh multiple attributes when categorizing a product and some can be in tension; for example, attributes related to product performance and attributes related to the social goodness of the product (Lin & Chang, 2012; Luchs et al., 2012; Newman et al., 2014). Consumers believe that environmentally friendly products are less effective than regular products (Wei et al., 2018). When a company intentionally makes an environmentally friendly product, consumers assume that resources were taken away from product quality and, are therefore, less likely will purchase the product compared with when the same environmental benefit was unintentional (Newman et al., 2014). In parallel, I find that in the 90s, some companies

adorned their packages with, sometimes spurious, green claims (Wood et al., 2018) and the superficiality of many products touted as green became apparent to consumers and public opinion when in reality they were not green and a backlash against greenwashing arose. Therefore, when consumers are exposed to performance and environmental claims, they may think of a green-washing intention behind and discount the credibility of the green attribute (Wood et al., 2018). This is consistent with other studies showing that small companies are perceived as more socially responsible (Green & Peloza, 2011; Yang, Zhenshan et al., 2020). Similarly, studies examining perceptions of local food have shown that products sold by small, independent producers are also perceived as eco-friendlier even though they may be located at a greater distance from the consumer (Autio et al., 2013; Carroll & Fahy, 2015; Granvik et al., 2017; Ostrom, 2006; Smithers et al., 2008). This is due to, as said above, the consumers' conflation of local, traditional, sold by small producers, and greenness.

The shape of brand logos is used as a cue about the product's eco-friendliness; rounded brand logos convey better the product's greenness than squared logos (Meiting & Hua, 2021). This judgment occurs in low-involvement green products where consumers do not allocate too many cognitive resources to process information and trust more peripheral cues when assessing the outcomes (Atkinson & Rosenthal, 2014). In this context, the shape of the logos acts as a heuristic cue about the product, and rounded logos operate in a subtle way to communicate greenness. One possible explanation is that the association between round shape and greenness might intrinsically exist in human intuition (Meiting & Hua, 2021). Women are stereotypically thought to be warmer than men, and feminine attributes are considered appropriate for green brands as they resemble caring (Meiting & Hua, 2021; Slepian & Galinsky, 2016).

Similarly, brand names auditory features convey the eco-friendliness of the brand via metaphorical associations (Joshi &Kronrod, 2020). Silent consonants in brand names (i.e., /k/, /p/, /t/), in contrast to voiced consonants (i.e., /b/, /d/, /g/) are more effective in disclosing environmental friendliness, because silent consonants relate to human characteristics (i.e., good-heartedness, purity or honesty) that are metaphorically identified with environmental friendliness.

1.5.6 Combination of cues

As mentioned earlier, most of the studies examined one isolated cue, whereas three papers (Herbes et al., 2020; Magnier & Crié, 2015; Samaraweera et al., 2021) examined a combination of two cues. While Steenis et al. (2017) evaluated two cues in the same experiment, they did it individually, not considering their interaction.

Although it is out of the scope of my thesis, it is worth mentioning that some studies analyzed the interaction between indexical and iconic cues. For example, Pancer et al. (2017) demonstrated that products with green-colored packaging are deemed greener when accompanied by an environmental claim because consumers look for congruency between packaging cues and their implicit beliefs. When green color and eco-label are displayed together, consumers overcome the ambiguity to categorize a product as sustainable. However, when presented alone, either the color or the label, consumers feel skeptical and penalize the perception of product efficacy due to ambiguity.

Table 7. Findings per study

Authors	Year	Attributes/cues studied	Main findings
Autio et al.	2013	Origin	Local is interpreted as national or regional; local represents the care implicit in craftsmanship and small-scale, artisan production, fresher, safer, and "authentic" food.
Bazzani & Cannavari	2017	Origin	Local food is associated with nationally grown food, fresher and safer, using traditional methods and protecting a rural culture. Emphasis on the relationship with the farmer and the national origin rather than the number of miles. Local food is perceived green.
Carroll & Fahy	2014	Origin	The meaning of local is "elastic": it stretches or contracts depending on the consumer's location (as this affects the perceived availability of food, the relationship with local producers, and the relative size of the consumer's geographical location). Local food is perceived green.
De Feo et al.	2022	Packaging materials	Overwhelming confirmation of how glass is perceived as very sustainable from an environmental point of view and of how plastic is perceived as having little or no environmental sustainability.
Herbes et al.	2018	Packaging materials	Recyclable, biodegradable, and reusable packaging materials are perceived green. However, differences are observed across countries: Germans consider the material itself to make a green assessment.
Herbes et al.	2020	Packaging color Packaging materials	French rely more on packaging color and material to categorize products as green; Germans and Americans rely more on package claims and additional product searches.
Herrmann et al.	2022	Packaging materials	Consumers perceive paper-based as the more sustainable material and show a positive willingness to purchase. Consumers are not sure about bioplastic sustainability, and some consider it a greenwashing initiative and deliver a negative willingness to purchase.
Joshi & Kronrod. S1	2020	Vendor characteristics	Silent consonants in brand names (i.e., /k/, /p/, /t/), in contrast to voiced consonants (i.e., /b/, /d/, /g/) are more effective in conveying environmental friendliness of products, because they exemplify some human characteristics (i.e., good-heartedness, purity or honesty) that are metaphorically identified with sustainability.
J.oshi & Kronrod. S4		Vendor characteristics	
Lazzarini et al.	2017	Origin	Local (national) products are perceived green
Liem et al.	2022	Packaging color and materials	Consumers' perception of sustainability is mainly driven by their belief that packaging is recyclable and/ or reusable. Visible cardboard texture and a cardboard look, increase consumers' perception of sustainability.

Authors	Year	Attributes/cues studied	Main findings
Lindh et al.	2016	Packaging materials	Materials perceived as recyclable increase the greenness perception. Paper-based materials are perceived as the most sustainable ones, and plastic and metal are the least.
Magnier & Crié S1	2015	Packaging color, imagery, and materials	Consumers categorize as green products the ones with earth-colored packaging, packaging or logos with natural imagery, and with recyclable, biodegradable, or reusable packaging materials.
Magnier & Crié S2			
Magnier & Schoormans	2017	Packaging color	Consumers perceive white-colored packaging and fiber-based materials as more sustainable than red-colored ones and plastic materials.
		Packaging materials	
Meiting & Hua. S1	2021	Vendor characteristics	Consumers perceive brands with rounded brand logos green.
Meiting & Hua. S2			
Merlino et al.	2022	Origin	Draw a semantic map building on keywords adopted by the respondents to describe local production: sustainable for the environment, fresh, high quality, healthy, tasty.
Nguyen et al.	2020	Packaging materials	Consumers believe that biodegradable, reusable, and recyclable packaging is greener; paper-based packaging is perceived as eco-friendlier than glass or plastic.
Norton et al.	2022	Packaging materials	Determining key sustainable packaging attributes Biodegradability, disposal methods, and being made of renewable resources are the critical sustainable packaging attributes.
Ostrom	2006	Origin	Local is associated with indeterminate spatial scale (closely produced); a significant number of consumers associate local with characteristics of the food such as fresh or pesticide-free; others associate it with food sold by small, independent, hard-working, honest farmers. Local food is perceived green.
Pancer et al. S2A	2017	Packaging color	Consumers perceive green-colored packaging as more sustainable than orange one.
Pancer et al. S3	2017	Packaging color	Consumers perceived green as a signal of sustainability compared to grey tones.
Samaraweera et al. S2	2021	Packaging color	White-colored labels on packaging convey better the greenness of products than green-colored labels.
		Packaging imagery	Nature-related imagery on the packaging does not influence the overall eco-friendliness assessment; only label color affects this perception.

Authors	Year	Attributes/cues studied	Main findings
Scekic & Krishna. S1	2021	Vendor characteristics	Products sold by small firms are perceived as greener than those of large companies.
Scekic & Krishna. S2			
Scekic & Krishna. S3			
Scekic & Krishna. S4			
Scott & Vigar-Ellis	2014	Packaging color	Earth-colored packaging is perceived green.
		Packaging materials	Recyclable and biodegradable packaging materials convey greenness product perceptions.
Seo & Scammon. S1	2017	Packaging color	Green-colored packaging is perceived green specially when an environmental claim accompanies it.
Seo & Scammon. S2		Packaging color	
Smithers et al.	2008	Origin	Local is interpreted as sold by a local farmer. Local food is considered green.
Steenis et al.	2017	Packaging imagery	Nature or landmark imagery on packaging increases the greenness assessments of the product.
		Packaging materials	Consumers overestimate the environmental performance of glass and underestimate that of dry cartons; they correctly assess the environmental performance of cans (metal).
Wood et al. S1	2018	Vendor characteristics	Products sold by niche brands are assessed as greener than products sold by non-niche brands.

1.6 Conclusion

The concept of sustainable consumer good (see **Figure 4)** is a product with earth-colored packaging, nature-evoking imagery, made with a recyclable, biodegradable, and, or reusable material–typically paper or glass–, produced locally and sold by a niche or and small brand with a round-shaped logo and,or a brand name with silent consonants. Past literature has studied the sustainable consumer good concept following mainly an empirical-driven approach based on no theory and this does not allow understanding of the mechanism or the "whys" of green assessment. Few studies are based on theories that either explain the cues, one at a time, or describe the mechanisms whereby such cues are then associated and integrated into an overall judgment. One of the limitations of this explanation is that it does not illustrate why consumers holistically categorize a product as green and how the green concept has been formed. A more integrative explanation is needed.

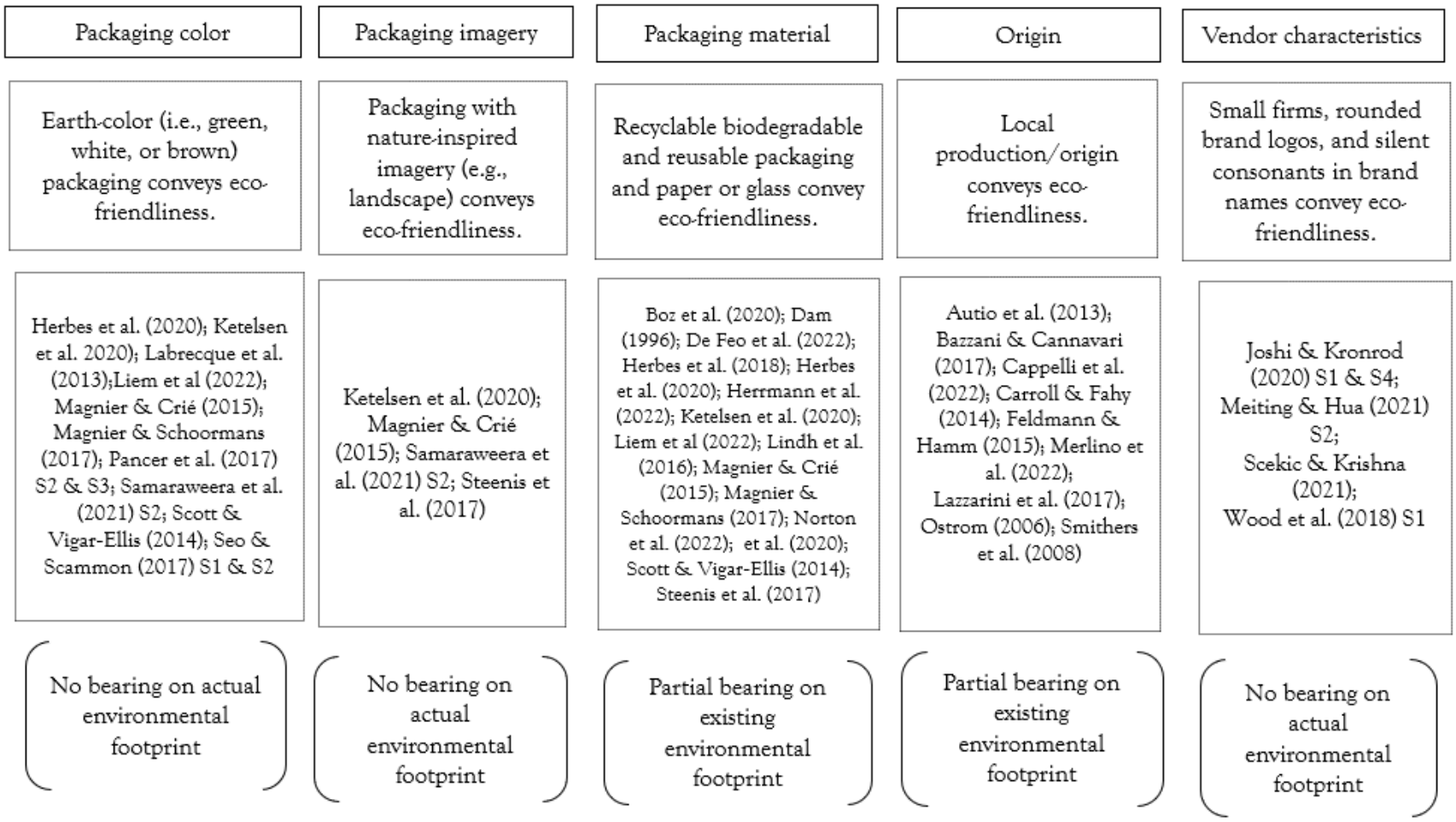


Figure 4. Delineation of the "sustainable consumer good product"

Chapter 2. Conceptual framework, proposed theoretical model and research agenda

2.1 Introduction

Based on the delineated "sustainable consumer good" concept proposed in Chapter 1, I aim in this dissertation to understand what explains consumers' inaccurate categorization. For this purpose, understanding how product concepts are formed is needed, as such concepts are later used for categorization. This is a gap in the literature, as scholarship has focused on attitudes towards and preferences for sustainable products (Bangsa & Schlegelmilch, 2020; ElHaffar et al., 2020). However, the study of how consumers categorize products as more or less green, eco-friendly or sustainable has been neglected (Gershoff & Frels, 2015). To address this gap, I first describe concept formation and categorization theories and apply them to explain how the green concept is formed (section 2.2), followed by a description of lay theories and its role in concept formation and inference function (section 2.3), then a theoretical framework is proposed (section 2.4), to finish with a research agenda (section 2.5), and a conclusion (section 2.6).

2.2 Concept formation and categorization

Concepts[3] are mental representations of categories (Komatsu, 1992) that consumers create, store in memory (Loken, 2006), and use to make evaluative judgments (Cohen & Basu, 1987; Ratneshwar et al., 1996). Categories are cognitive structures. A cognitive structure refers to how factual knowledge is organized in memory (Hutchinson & Turk-Browne, 2012). A consumer category is a set of products, services, brands, or other marketing entities, states, or events that appear to the consumer related in some way (Loken et al., 2008). People use categories to simplify and structure their environment and to represent their world (Hutchinson & Turk-Browne, 2012). These categories are then used not only to assign novel items to a category and to evaluate them (Loken, 2006; Ratneshwar et al., 1996), but are also implicated in other cognitive processes such as attention, information retrieval, and decision-making (Wyer Jr & Kardes, 2020). Therefore, understanding categorization processes allow for a more nuanced comprehension of the potential reasons underpinning the evaluation of objects or products (Gershoff & Frels, 2015) and a deeper

[3] Concepts, categories, structures, and representations will be used hereafter as synonymous.

consideration of which changes in cognitive structures are more likely to affect consumer behavior by changing how decisions are framed (Alba & Hutchinson, 1987).

It has to be considered that categories are informed by domain-specific, causal-explanatory theories that are not solely constructed bottom-up from a perceptual basis. Persistent cognitive biases influence what information we take in and consider (Alba & Hutchinson, 1987).

2.2.1 How concepts are formed

There are two broad approaches to explaining concept formation (Komatsu, 1992): similarity-based and theory-based (a visual summary of these approaches can be found in **figure 5**).

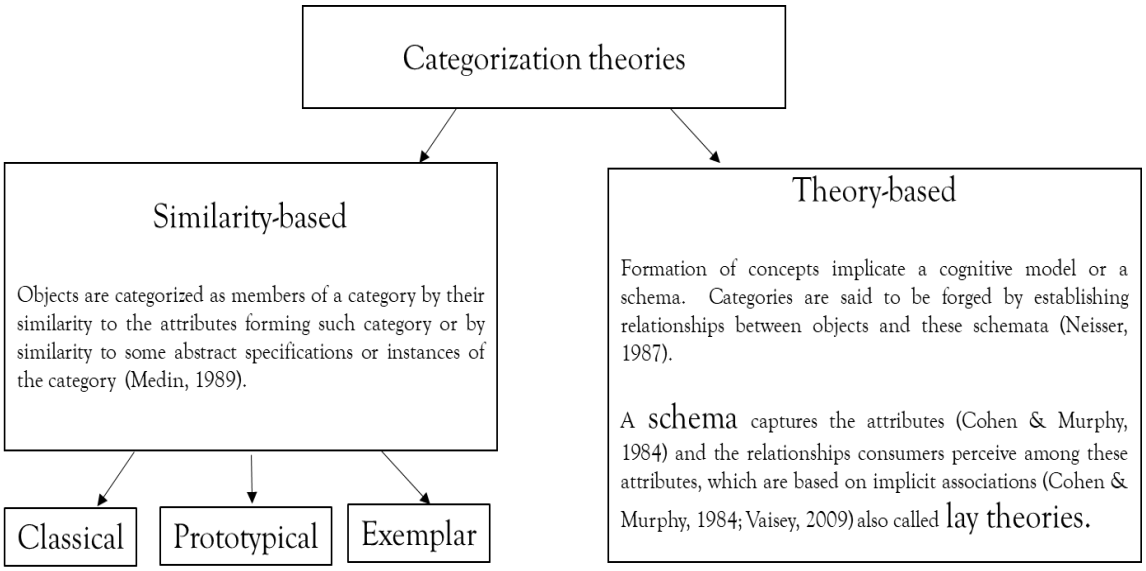


Figure 5: Summary of categorization theories

Proponents of similarity-based approaches contend that objects are categorized as members of a category by their similarity to the attributes forming such category or by similarity to some abstract specifications or instances of the category (Medin, 1989). The classical, prototypical, and exemplar theories of categorization fit into the similarity-based approaches and are explained in turn.

According to classical theories, concepts are formed by necessary and sufficient attributes (Medin & Smith, 1984; Medin & Wattenmaker, 1987). Any entity that possesses these necessary and sufficient attributes is considered a category member; even lacking one of these attributes would lead individuals not to categorize an entity as part of the category. Although the classical view was dominant in the 70s, it lost favor when research showed that it was ill-suited to explain the formation of natural, everyday concepts as concept formation is a more complex process than this theory depicts (Cohen & Basu, 1987; Komatsu, 1992; Waxman, 1991). Prototypical theory poses that more essential representations of a category allow people to describe other things as being in the same category, but different in specific ways (Rosch, 1973). Exemplar-based theory proposes that concepts are formed by specific exemplars of a category, rather than abstracted features (Kardes et al., 2004). Thus, concepts are created by simple associative processes that can operate automatically without significant cognitive resources (Loken et al., 2008). When something new is encountered, the item recruits' information from other concepts in memory that are similar to it and that information determines the response (Hutchinson et al., 2010).

These three similarity-based theories do not explain how concepts are contextually mobilized and flexibly applied; why individuals pay attention to specific attributes and not others to define a category; how similarity is assessed – given that all attributes could be potentially similar to all attributes-; the intra-property coherence of concepts and the relations established with other concepts (Medin & Wattenmaker, 1987). Theory-based approaches to concept formation intend to overcome these weaknesses.

Theory-based approaches to concept formation defend that the formation of concepts - especially complex concepts (Medin & Smith, 1984), superordinate categories (Neisser, 1987) and concepts of entities with limited perceptual properties implicate a cognitive model or a schema (Medin & Smith, 1984). In this view, categories are said to be forged by establishing relationships between objects and these schemata (Neisser, 1987). A schema is an abstract mental structure that provides a consistent representational structure for abstracted information and information about instances (Medin & Smith, 1984). Consumers create schemata about product categories (Komatsu, 1992), store them in memory (Loken, 2006) and use them to make evaluative judgments (Cohen & Basu, 1987;

Ratneshwar et al., 1996). These schemata would guide the salience of attributes constituting the category, the conceptual coherence, and the reasons for the intra-property relations (Medin & Wattenmaker, 1987). These schemata are then used not only to assign novel items to a consumer category and to evaluate them (Loken et al., 2008; Ratneshwar et al., 1996) but are also implicated in other cognitive processes such as attention, information retrieval, and decision-making (Wyer Jr & Kardes, 2020). A schema captures the attributes (Cohen & Murphy, 1984) and the relationships consumers perceive among these attributes, which are based on implicit associations (Cohen & Murphy, 1984; Vaisey, 2009) also called lay theories and they will be explained in section 2.3. and introduction.

2.2.2 How concepts are used

Categories are used both in a stable -as they are structures frequently invoked mentally (Mervis & Rosch, 1981)- and in a flexible manner - because they adapt to infinite cases (Loken et al., 2008). Categories require considerable flexibility, as consumers adopt them to an unlimited number of situations and unexpected environmental changes. Category flexibility is influenced by variables such as emotional states and level of expertise; for instance, a positive mood state has been found to increase category flexibility (Isen & Daubman, 1984).

Once a category is stored in mind, consumers will use it to make inferences or categorize novel *stimuli*. This process is called activation of a category representation. It depends on accessibility which is usually measured with metrics of increased recall, increased use of the representation in subsequent judgments, and faster response times on either memory or judgment tasks (Loken et al., 2008).

Applying this view to the phenomenon under examination, I contend that to categorize products as sustainable, consumers use *a prior* theory of what "sustainability" is, rather than only comparing a product with a list of features of what constitutes a "sustainable consumer good". Consistent with theory -based approaches (Komatsu, 1992; Medin & Smith, 1984), we do not deny that similarity is at play for concept formation; instead I defend that such similarity judgments are guided by cognitive models that determine what is to count as a relevant property and the importance of particular properties (Medin, 1975). Bridging what has been exposed in Chapter 1, the similarity with nature guides the categorization of a

packaging as eco-friendly. However, what is at the base is a cognitive model that sustainability is nature. The same happens with round logos: if it evokes the feminine prototype, it is greener because there is a cognitive model behind reflecting feminine is more caring and therefore sustainable.

These cognitive models are not necessarily supplied by or reflective of scientific knowledge (Komatsu, 1992; Neisser, 1987). Rather, the formation of complex concepts has been found to implicate folk, naïve or lay theories (Murphy & Medin, 1985). Lay theories comprise informal or "common-sense" explanations that people use in their everyday lives to make sense of their world (Furnham, 1988). In my domain of study, lay theories are consumers' theories about the sustainable character of a product that does not correspond to scientifically proven truths, and may even go against them; however, they give a sense of truth to the individual (Levy et al., 2006) and are typically adopted and held without being scientifically tested (Deval et al., 2016). I next turn my attention to lay theories.

2.3 Lay theories

2.3.1 Definition of lay theories

Lay theories are the individuals' understanding of the deeper structure of objects and event (Murphy & Medin, 1985; Niedenthal et al., 1999). Lay theories or implicit beliefs, and folk, lay naïve theories or intuitions are terms used indistinctly (Furnham, 1988), although some nuances among them have been identified. To illustrate, Furnham (1988) clarified that a theory involves a higher degree of congruity, order durability, and rational features that may not be required of lay concepts. In this thesis, I use the term lay theories to refer to the cognitive models that guide the categorization of consumer products as sustainable.

More formally, lay theories are comprised of two related components: (1) ontological commitments or categorical associations and (2) causal laws or propositions that relate the associations (Gelman & Noles, 2011). First, the ontological commitments or categorical associations concern the category to which the object is perceived to belong and the properties typically associated with entities in that group. To illustrate, consumers categorize over-the-counter or nonprescription drugs as relatively risk-free (Homer & Mukherjee, 2018). The risk-free attribute (ontological commitment) extends to any entity

belonging to this category (over-the-counter drug). The second necessary component of a lay belief is a causal relationship or proposition linking the ontological commitment and the category, usually in an "if X then Y" structure (Gelman & Noles, 2011). In the example above, if sold without a prescription, then it is risk-free (Homer & Mukherjee, 2018). Other examples of these causal structures are "if a product is expensive, then it is well-made" (Milgrom & Roberts, 1986) or "if a product is rare, then it must be valuable" (Newbert, 2008), or "if it tastes bad, then it must be good for you?" (Wright et al., 2013).

Lay theories can diverge on four criteria. First, they differ in their level of articulation (more or less explicit). People assess them typically via self-report (Levy et al., 2006); for instance: if it tastes good, then it is unhealthy (Raghunathan et al., 2006). Second, they differ in the frequency or activation of use. If lay theories are repeatedly activated, their salience increases; because they are to greater extend accessible to individuals, they influence categorization processes (Levy et al., 2006). Third, they differ in the range of applicability. Some theories are broad, whereas others have a limited range (Levy et al., 2006). For example, fixed and incremental mindsets (Jain, Shailendra Pratap & Weiten, 2020) are broad lay theories since they have been found to applicate in different domains, such as beliefs about personality, intelligence, self-control, and relationships, among others. In contrast, a domain-specific lay theory like healthy food is expensive (Haws et al., 2017) only applies to the food domain. Fourth, they differ in the degree of universality. Some lay theories are more extensively shared in different societies while others are not; for example, a diamond ring as a sign of engagement is a lay theory shared in developed countries (Deval et al., 2016).

Furthermore, multiple incompatible theories can coexist side-by-side within individuals and not only among individuals (Deval et al., 2016) even when available information is held constant. As a result of this, consumers draw different conclusions as a function of which lay theory is primed. For example, if a consumer sees a product in price promotion (available information), some of them can believe to be witnessing a marketing strategy to push sales of a non-performing product, whereas other consumers can believe that the company is encouraging trial because the company is convinced about the benefits of the product. These two lay beliefs are contradictory and are based on the same available information (price promotion). The probability of purchasing a product that is on price

promotion may depend on which of these lay theories is activated during the purchase process. Marketers have less control over which lay theory is activated at the time that the brand is encountered (Deval et al., 2016).

Lay theories come up from various sources, such as personal experience, common sense, misinformation (Deval et al., 2016), inference and deductions from repeated observations of co-occurrences, analogy or extrapolation from specific encounters, authority or acceptance of ideas from others, for example, the media (Furnham, 1988; Sarbin et al., 1960).

2.3.2 Lay theories' role in concept formation and inference function and how lay theories are developed

Important to the phenomenon under study, lay theories shape concept formation as evidenced in different domains; for example, lay theories such as "immigrants steal jobs" or "immigrants abuse the welfare system" (Boyer & Petersen, 2018) are *a priori* theories that shape the categorization of immigrants. Similarly, lay theories about an immutable, shared "essence" within each gender, limit what a man or woman is like but also what s/he can become (Folkes & Matta, 2013). In the consumption domain, lay theories are implicated in the consumers' understanding of consumer goods; to illustrate, consumers believe that if the package is slim, then the brand is high-end, following a lay theory about the person's body shape and their socioeconomic status (Chen, H. et al., 2020). These examples illustrate the influence of lay theories in concept and attitude formation.

Beyond its influence on concept formation, lay theories may perform additional functions and the most common and the most relevant for my domain of study is the influence on inference making (Furnham, 1988; Hewstone et al., 1983). The inference process can be performed in two ways: inter-attribute correlations (Kardes et al., 2004) and categorical groupings. Regarding inter-attribute correlations, consumers often hold lay theories about how product attributes relate to one another. They often make judgments and inferences about products based on their intuitive relationships among attributes. For instance, a common lay theory is that if a good is highly priced, then it is of high quality (Gerstner, 1985; Kalita et al., 2004) or if it tastes bad, then it must be good (Wright et al., 2013) or if it is light (in calories), then it must be healthy, where consumers perceive foods that weigh

less are healthier than their heavier counterparts with the same serving size (Li & Chapman, 2012).

The categorical grouping mechanism refers to using lay theories inferences based on the category to which a product is assigned (Broniarczyk & Alba, 1994). Depending on the situation, on which attributes of a product are most evident or primed, consumers may categorize the same entity into different subcategories based on the prevalent features such as the country of origin, the brand, relative quality of the firm's products, or the relative success of the firm selling a product. All of these can be used by consumers to generate lay theories and build inferences (Hong & Wyer Jr, 1989; Loureiro & Umberger, 2007).

Returning to the subject of inference process, it is key to mention that both the spillover effect and the halo effect are related to the inference process in the sense that they both involve mechanisms whereby we draw conclusions and make judgments based on limited information (Bettels & Wiedmann, 2019; Sundar et al., 2021). The spillover effect occurs when the perception of one attribute of a product influences our perceptions of unrelated traits or attributes (Janakiraman et al., 2006) . This can work both positively and negatively. If we have a positive experience or impression of one aspect of a product, we are more likely to have positive feelings or judgments about other aspects, even if those aspects are not directly related (Penz et al., 2019). The spillover effect, in the context of the inference process, involves the transfer of feelings, judgments, or impressions from one aspect of a product to another unrelated aspect. This can impact how we infer the qualities of those unrelated aspects (Penz et al., 2019). For instance, imagine a company known for its environmentally friendly packaging, using biodegradable materials and minimal plastic. Consumers may start to assume that the product itself and not only the packaging is also environmentally friendly and of higher quality. This inference occurs even if there is no direct evidence or information about the products' actual sustainability or quality.

The halo effect refers to a cognitive bias where our overall impression of a product influences how we perceive their specific qualities. In other words, if we have a positive impression of product due to a specific characteristic (such as feminine brand image), we are more likely to assume that other aspects of that product are also positive, even if we lack direct evidence for those qualities. In the context of the inference process, the halo effect can lead us to make unwarranted assumptions or generalizations based on a single positive

trait or characteristic. When we perceive something positively in one aspect, we tend to infer that other aspects must also be positive, even if we lack evidence to support those inferences. This can lead to faulty reasoning and incomplete understanding (Richetin et al., 2021). To illustrate, if a product has a brand name that refers to a natural place (e.g. The Alps) or traditional production method (e.g. The old mill), consumers can form an overall impression of environmental sustainability and are more likely to assume that other aspects of the product are also green.

In both cases, these effects highlight how our cognitive biases can impact our ability to make accurate inferences. Our judgments and conclusions may be biased due to the automatic transfer of positive or negative perceptions from one aspect to another, regardless of whether those aspects are logically connected. Being aware of these biases can help us make more informed and unbiased inferences based on a more comprehensive understanding of the available information.

2.3.3 Lay theories and heuristics

It is important to highlight that lay theories and heuristics are separate constructs but they operate together. Heuristics can be defined as "cognitive shortcuts that enable individuals to make evaluations based on one or a few simple rules or cues, thereby avoiding the processing and time costs related to exploring an exhaustive set of possibilities" (Marsh, 2002. p. 49). It is important to remark that heuristics are formulated to enable fast and frugal decision-making (Gigerenzer & Gaissmaier, 2011). Lay theories are antecedents of heuristics (Cheng et al., 2017; Gomez, 2013; La Macchia et al., 2016) so that these shortcuts are formulated based on the beliefs a person holds.

More specifically, lay theories and heuristics can be differentiated across three dimensions: their number, scope, and degree of consciousness. Lay theories are limited and consistent across situations (Furnham, 1988), whereas heuristics may be infinite and applicable to different domains. For example, the "hard work leads to success" lay theory leads to the formulation of a "cost-benefit" heuristic (Cheng et al., 2017) that is subsequently applied as cognitive shortcuts in many domains, such as consumption (i.e., a bad-tasting medicine is considered more effective) or workplace (i.e., if you put in the effort, you will get promoted). Second, lay theories are used unconsciously, and individuals struggle to

articulate them (Furnham, 1988), whereas heuristics can be used consciously and unconsciously (Gigerenzer & Gaissmaier, 2011). To illustrate, Folkes et al. (2013) empirically demonstrated the lay theory that gender expresses itself in a person's output against experiential evidence, which is the antecedent of manifold heuristics such as women being worse drivers than men or women being lost more often than men (Armstrong & Nelson, 2005). Whereas individuals may report the latter belief or heuristic, the lay theory on which this heuristic is based is less accessible to the conscious mind.

Past work has suggested that heuristics may explain why consumers categorize products as green. I claim that focusing on lay theories provides a higher-order explanation (Komatsu, 1992) for these heuristics. For example, the "small =green" heuristic proposed by Wood et al. (2018) could emanate from a general lay theory of group size (La Macchia et al., 2016), where small groups are considered trustworthy and benevolent, warm, easier to influence, more cohesive and cooperative. Therefore, this lay theory may allow consumers to formulate a set of heuristics so that the size of a group/brand is used as a fast and frugal shortcut to categorize a product as green. In other words, whereas the lists of heuristics used by consumers in green product categorization may be infinite (i.e., craftsman=green, Judge et al., 2020b; local=green, Lazzarini et al., 2017), these heuristics or rules of thumb are anchored in a limited set of lay theories that provide the if–then content (Cho & Schwarz, 2008).

Moreover, heuristics are based on metaphors and symbols, as shown in Section 1.3. To illustrate, the packaging color provides a heuristic that helps quickly categorize the product as green. Earth colors symbolize nature, and what reminds us of nature is considered greener (Steinhart et al., 2014). Thus, the lay theory "if it reminds me of nature, then it is green" determines that earth colors form part of the green product schema and provides a heuristic that assists in interpreting the product attributes and making a quick categorization.

2.3.4 Moderating factors of lay theories in the categorization process

In this sub-section, I aim to briefly explain under which circumstances lay theories guide categorization or, in other words, the boundary conditions of lay theories in the categorization process as my goal is to understand how products are categorized. Previous

literature showed situational and individual factors as moderators (Haws et al., 2017; Steinhart et al., 2014).

When consumer process information peripherical they increase the use of lay theories (Deval et al., 2016); for example, situational factors such as time constraints and/or limited search efforts to choose a brand or product may incline consumers rely more on lay theories (Chen et al., 2020). When the activated lay theory matches the *stimulus* message, reliance on lay theories is higher; in this case, consumers' product perceptions tend to be more favorable compared to the situation where the lay theory and the *stimulus* are mismatched (Haws et al., 2017; Steinhart et al., 2014). For example, self-expressive products (*stimulus* messages) conveying uniqueness match the lay theory of exclusivity (Steinhart et al., 2014).

Individual factors such as consumer knowledge or expertise play a role as expert people are less prone to rely on lay theories as they have far fewer informational gaps and a well-established criterion to evaluate the product (Deval et al., 2016). Other individual factors, such as processing style (Evans & Stanovich, 2013), increases or decreases the use of lay theories subject to using type 1 processing style (heuristically) or type 2 (a more elaborated thinking) (Haws et al., 2017). When consumers increase awareness through cognitively controlled processes (type 2), the lay theory is deactivated, as illustrated by Mai & Hoffmann (2015) in their study that showed that by raising health consciousness, the "healthy=untasty" lay theory is disabled.

2.3.5 The study of lay beliefs in consumer behavior

Scholarship has studied how consumers hold lay theories in different aspects of their life, as described in the previous section. Individuals hold lay beliefs about personality traits believing that gender expresses itself in a person's output against experiential evidence; for instance, if music played sounds softer, then it is a woman playing it (Folkes & Matta, 2013).

Within consumer behavior, lay theories have been widely studied. To show some examples of this research, past scholarship has shown that lay theories about packaging shape consumers' inferences of brand status (Gao et al., 2022); lay theories about health make consumers categorize healthy products as less tasty (Raghunathan et al., 2006) and more

expensive (Haws et al., 2017). Furthermore, lay theories have already been proven to influence consumers' preferences for green products. For instance, the "if sustainable, then it is not that strong" lay theory (Luchs et al., 2012; Mai et al., 2019) leads consumers to reject green attributes in strength-dependent categories and favor them in gentleness-dependent categories (Skard et al., 2020). However, lay theories' influence on consumers' categorization of products as green has been overlooked. This thesis aims to redress this gap.

With regards to methodologies used to study lay theories, two approached have been carried depending on the aim of the study, that can be unveil lay theories or, once labeled, study their effects. For the first goal and considering lay theories often take the form of core assumptions, and individuals can articulate them only poorly (Dweck et al., 1995) and in-depth interviews are deemed appropriate for unveiling them (Evans & Stanovich, 2013; Pflug, 2009). During the interview, individuals are asked to perform a task, then explain their choices, and researchers observe manifestations of the implicit content during its performance (Wörfel, 2021). Then, researchers interpret the multifarious ways consumers express their implicit beliefs and unearth and label these lay theories—this labeling demand inference-data analysis and interpretation (Spiggle, 1994)

With regards to the study of an existing lay theory, experiments are the method mainly used to test the influence of lay theories on cognitive or behavioral outcomes (Escalas & Bettman, 2003; Yorkston et al., 2010). Finally, to measure the strength of associations between target concepts (i.e., energy-dense food) and evaluative attributes (i.e., tasty) (Mai & Hoffmann, 2015; Raghunathan et al., 2006), Implicit Association Test (IAT) is used where a computer-based reaction-time establish the strength of associations between concepts and evaluative attributes.

Once studied concept formation and lay theories guiding role in categorization, I now move to present my theoretical framework based on the conceptualization exposed.

2.4 Proposed theoretical framework

Building on what has been explained, I outline an integrative theoretical framework drawing from schema categorization theory to provide a more integrative explanation of

how consumers categorize products as green (Cohen & Basu, 1987; Komatsu, 1992). My model is based on four fundamental propositions. **Figure 6** captures my proposed model.

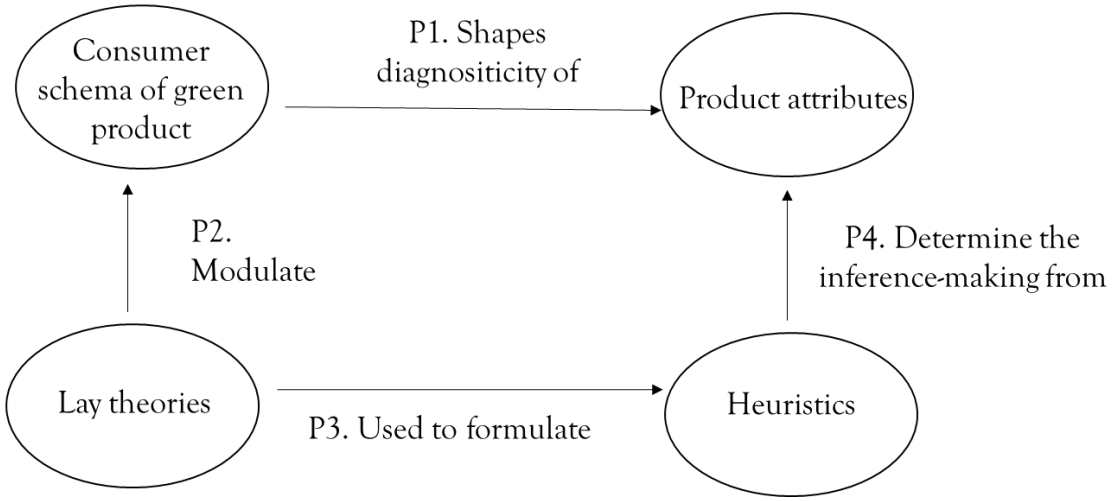


Figure 6. Integrative conceptual framework of eco-friendly consumer goods categorization in the absence of indexical cues

Consumers hold a schema of what can be counted as a "green product"; this schema has been an unmeasured construct in past studies. However, this is a crucial construct since the green product schema determines which attributes are considered diagnostic cues of greenness (i.e., green-colored packaging). Consumers, thus will pay attention to these diagnostic attributes to categorize the product as green.

> Proposition 1: Consumers possess a schema for what constitutes a "green product," which influences their perception of attributes that indicate its eco-friendliness, such as green color.

Lay theories modulate the formation of this green product schema. If consumers believe that earth-colored packaging signals eco-friendliness, this is because a lay theory has shaped this schema. A potential lay theory that needs to be empirically tested could be “If it reminds me of nature, then it is green.”

> Proposition 2: Lay theories, informal explanations that people use daily, shape the formation of the green product schema. For example, a lay theory might suggest that an earth-colored packaging signifies eco-friendliness.

Lay theories are used to formulate heuristics. As explained in section 2.3.3. Lay theories and heuristics are separate constructs and lay theories provide a higher-order explanation for heuristics (Komatsu, 1992).

> Proposition 3: Lay theories lead to the formulation of heuristics, which are cognitive shortcuts that enable quick decision-making. Heuristics are based on beliefs and can be conscious or unconscious. Lay theories are antecedents of these heuristics

Finally, lay theories directly or mediated by heuristics determine or guide the inferences made by consumers when interpreting product attributes.

> Proposition 4: Heuristics, often based on metaphors and symbols, guide consumers' interpretations of product attributes, influencing how they categorize products as green.

2.5 Research agenda

Building on this conceptual framework, a research agenda is presented around seven themes grouped into two blocks, namely, (1) Lay theories and (2) Attributes. Each of these research themes is explained in turn (see the summary in **Table 8**).

Table 8. Future research lines

Lay theories	Empirically identify the lay theories modulating the formation of green consumer product schema
	Explicate how product? Or Brand? eco-friendliness lay theories are formed
	Establish under which circumstances consumers rely more (less) on sustainability-related lay theories to make eco-friendliness assessment
	Test effective interventions to halt the inaccurate categorization of green products
Attributes	Disambiguate conflicting findings regarding color and nature-related imagery
	Identify other attributes that may be considered diagnostic of product greenness
	Examine how different cues combine to make an overall assessment and the psychological mechanisms followed to resolve contradictions among cues

The first block of research questions revolves around questions on lay theories. First, future empirical work should empirically identify the lay theories influencing consumers' assessment of eco-friendliness. Research on how lay theories influence consumers' decision-

making is scant, and the bulk of research examines the influence of lay theories on health choices (Raghunathan et al., 2006). However, it is relevant to know which lay theories guide the categorization of products as green, especially for policy-making against greenwashing: if manufacturers' tapping into these lay theories may lead consumers to make an inaccurate green assessment (Deval et al., 2016). In chapter 3, I address this research line and work is pursued to unveil consumer green lay theories.

As a second avenue for future research, I propose to examine how eco-friendliness lay theories are formed. Lay theories emerge from four different processes: induction or experience; construction or inference and deductions from observations; analogy or extrapolation from specific encounters; and authority or acceptance of ideas from others (Furnham, 1988). Future work should focus on these processes and study the origins of lay theories and how they are developed, as the variables relevant to their construction may be distinct from one context to another (Deval et al., 2016).

Third, complementing this, future work should examine when people rely more or less on sustainability-related lay theories. Lay theories are also more likely to operate when individuals have limited time and/or dedicate little search effort to choosing a brand or product which normally happen when purchasing consumer goods (Chen et al., 2020). Furthermore, evidence shows that individuals' reliance on lay theories is more significant when they use type 1 processing style (peripherical) versus type 2 (a more elaborated thinking) (Haws et al., 2017) leading to less (more) critical evaluation and an increased (decreased) trust (susceptibility) to lay theories. Specifically, I will examine two moderators in chapter 4. These are predisposition nostalgia and advertising skepticism.

Furthermore, reliance on lay theories is higher when the activated lay theory matches the *stimulus* message; in this case, consumers' product perceptions tend to be more favorable compared to the situation where the lay theory and the *stimulus* are mismatched (Haws et al., 2017; Steinhart et al., 2014). Thus, the less elaborated thinking, the less time, and the higher match between lay theory and the *stimulus* message, the higher reliance on lay theory. In chapter 4, I address this research line and empirical work is pursued to explain why and when reliance on a specific lay theory occurs.

Finally, future work should test effective interventions to halt the inaccurate categorization of green products. For example, in the experiment reported by Ferrara et al. (2020), most

consumers were open to considering an eco-friendly packaging material once they were informed about its environmental footprint. They reassured that this material had no negative bearing on the organoleptic qualities of the product. Thus, studying the design of consumer education initiatives that can deactivate the reliance on lay theories in green product categorization is a matter of further research.

Concerning attributes, three future inquiry lines are proposed. First, I recommend deepening the study of cues to obtain more evidence about what product attributes are found to be diagnostic of eco-friendliness. For example, the diagnosticity of packaging colors is unclear since some studies find that green color is more diagnostic than grey/red but is less able to convey greenness when compared to white (Samaraweera et al., 2021). Therefore, is white the new green? Similarly, regarding the nature-imagery features shown in Subsection 1.5.2, it is still unclear which nature-related images are associated with eco-friendlier perceptions, as studies have found contradictory evidence (Pancer et al., 2017; Samaraweera et al., 2021).

Not only is it necessary to resolve past contradictory evidence but also to determine whether other attributes may be considered diagnostic. For instance, packaging size has yet to be examined. Beyond packaging cues, other perceptual cues in communication *stimuli*, such as the background used in advertisements (urban environment *vs.* natural landscapes), could affect the greenness assessment. Similarly, further work could study whether other concepts, such as "natural" or "healthy", and the cues used to assess them may also affect the categorization of green products (Etale & Siegrist, 2021).

Third, future work should study how different cues combine to make an overall assessment. Products have multiple attributes (Orth & Malkewitz, 2008). Still, most past studies have only examined one of these attributes simultaneously, thus failing to explain how different cues are integrated to make an overall judgment. As a result, we need to pay attention to which attributes consumers prioritize to assess product greenness. Drawing on centrality theory (Gershoff & Frels, 2015; Sloman et al., 1998), future work should discern whether there is a central attribute that conditions the assessment (Veryzer, 1999). Additionally, a future line of inquiry should focus on how weights are assigned to each attribute depending on its association with the category (Cohen & Basu, 1987; Loken et al., 2008).

Moreover, more evidence is needed to understand how the green assessment is affected by contradictory iconic cues and how consumers assess the product's greenness when faced with contradictory indexical and iconic cues. It is also crucial to understand whether some irrelevant cues are more diagnostic than others, as this may serve as the basis to set clear rules for the industry to prevent greenwashing.

Chapter 3. Unveiling lay theories that guide the categorization of consumer products as green

3.1 Introduction

As discussed in chapter 1, past scholarship has shown that when a product does not have an environmental label or claim, consumers rely on other cues such as color, imagery, or packaging materials, to decide whether the product is green. In chapter 2, it is defended that lay theories shape the "green product" schema held by consumers. I carried out an interpretive study using a narrative laddering technique (Greenwald et al., 1998; Greenwald et al., 2003) to uncover the higher-level but implicit cognitions consumers use to categorize products as green (Miles & Rowe, 2004; Reynolds & Gutman, 1988). This empirical piece led us to identify and label three lay theories that seem to guide the interpretation of the cues.

In this chapter is the following: first the methodology implemented is explained (section 3.2), then findings (section 3.3) and discussion and theoretical contributions (section 3.4). Note that the theoretical framework applied has been explained in chapter 2 and practical contributions will be discussed in conclusion section.

3.2 Methodology

Unveiling consumers' schema and its lay theories is not easy (Wörfel, 2021) since lay theories are usually implicit (Greenwald & Banaji, 1995). Consequently, individuals have difficulties articulating lay theories verbally (Dweck et al., 1995). As discussed in chapter 2, in-depth interviews are deemed appropriate for unveiling schema and lay theories (Evans & Stanovich, 2013; Pflug, 2009). During the interview, individuals are asked to perform a task, then explain their choices, and researchers observe manifestations of the implicit content during its performance (Wörfel, 2021). Then, researchers interpret the multifarious ways consumers express their implicit beliefs and unearth and label these lay theories—this labeling demand inference-data analysis and interpretation (Spiggle, 1994).

Following these suggestions, I started the interview with an open conversation with consumers; they were asked to freely express their beliefs about what they understand by environmental footprint and what constitutes a green product. Then, a laddering technique was used since it elicited higher-level abstractions of the concepts people use to

make sense of their world (Miles & Rowe, 2004; Reynolds & Gutman, 1988). For the ladders, sets of visual *stimuli* of consumer goods were presented to informants. Each set consisted of three products. The sets were sorted into three groups. The first group was based on the experiment design by Steenis et al. (2017); informants were shown *stimuli* of the same brand and product but packed in different packaging materials (i.e., tomato sauce in glass, tetra pack, or tin). The packaging material was held constant across images in the second group of *stimuli*. The products shown differed in brand names/origin, imagery, and color on packaging (i.e., a liter of milk in a tetra pack from different brands). Finally, the third group depicted the same product in different packaging materials and brand names following research conducted by Magnier and Crié (2015). This approach combines the packaging cues in three ways to understand the diagnosticity of each cue (see **Table 9** for a description of *stimuli*). The interview guide and pictures of products used are available in **Appendix 1** and **Appendix 2.** Real brands were used, as this allowed us to observe whether brand awareness or associations play a part in assessing greenness, following the suggestions of past authors (Magnier & Crié, 2015; Steenis et al., 2017; Wood et al., 2018). For each *stimulus* shown, informants were asked to assess the greenness of products. Then, they were asked to explain which feature of products was used to make this categorization. Following the laddering technique, the interviewer repeatedly asked "why" until the informant could express the implicit beliefs underpinning the cue's use and interpretation.

Table 9: Description of *stimuli*

***Stimuli* type**	**Consumer goods categories**
The same brand and product are packed in different packaging materials	Tomato sauce, vegetable cream, olive oil
Same packaging material but a different brand	Milk, marmalade, yogurt, laundry detergent
Different materials and different brands.	Spanish gazpacho, asparagus, shampoo

The selection of informants was guided by the tenets of purposive sampling, typifying and sampling behavior, and not people (Glaser, 1978). During the screening interview, the respondents' green behavior was assessed based on declared behavior (i.e., recycling materials, using public transport, minimizing energy waste). Moreover, the sampling criteria changed as I proceeded with the analysis. After interview number 4, saturation was reached (Creswell & Creswell, 2017); I conducted 17 more interviews to ensure variability and diversity in the profiles (Whittemore et al., 2001). To disambiguate whether age, social

class, occupation, and self-reported green behavior were discriminating variables, I searched for informants of younger generations, different social classes, different occupations, and different pro-environmental behaviors. In addition, to assess whether brand awareness or brand associations play a part in determining greenness, profiles of individuals not socialized in Spain and unfamiliar with the brands were sought. Overall, including more profiles increased variability but did not add new findings regarding the existing lay theories and their use in green product categorization. In other words, I found a substantial similarity among respondents in their cue interpretation, including the ones not raised and grown in Spain.

A combination of convenience–aided by a post on social media–and snowball sampling was used (Cherrier, 2007; Cherrier, 2010). **Table 10** shows the profiles of the informants. The final sample comprised 21 people, balanced in gender (n=12 male; n= 9 female) and green behavior (strong, n=6; medium, n=9; low, n=6). The mean age was 45 years. The fieldwork was conducted during January and February 2022 in Spain. Eighteen interviews were carried out online, following the preference of informants. Interviews lasted between 35 and 60 minutes. The University's Ethical Committee approved the procedure for data collection and analysis.

Each interview was transcribed and analyzed before the following interview (Creswell & Creswell, 2017). The study was done in three stages. First, I identified the diagnostic cues used by consumers. Previous cues identified in the literature were used as initial codes. Second, ladders were built for each informant; each ladder depicts the cues and the reasons acknowledged by informants to explain why these cues were diagnostic of greenness. Constant comparison matrixes were used to assess the similarities and differences among respondents (Whittemore et al., 2001). An iterative process of literature reading and data analysis was followed to identify and label the three lay theories that explicate the findings.

Table 10. Description of informants

	Age	Gender	Social class	Place of residence	Occupation	Self-reported Green Behaviour
R1	37	Female	High	Spain	Marketer	Strong
R2	61	Male	High	Spain	Engineer	Low
R3	46	Female	High	Spain	Journalist	Strong
R4	32	Female	High	Spain	Marketer	Medium
R5	58	Male	Low	Spain	Taxi driver	Low
R6	42	Male	High	Spain	University Teacher	Medium
R7	40	Female	High	Spain	Marketer	Strong
R8	55	Male	High	Spain	General Management Consultant	Low
R9	63	Male	High	Spain	Psychologist	Medium
R10	46	Female	Medium	Spain	Nurse	Low
R11	52	Female	High	Holland	Merger & Acquisition Consultant	Medium
R12	18	Male	Medium	Spain	Student	Strong
R13	19	Female	Medium	Spain	Student	Strong
R14	18	Male	Medium	Spain	Student	Medium
R15	57	Female	Low	Spain	Household employee	Medium
R16	47	Male	High	Spain	Engineer	Low
R17	61	Female	Low	Spain	Concierge	Medium
R18	60	Female	Low	Spain	Household employee	Medium
R19	53	Male	Medium	Spain	Computer Specialist	Low
R20	21	Male	Medium	U.S.A.	Student	Medium
R21	60	Male	High	Canada	Architect	Strong

3.3 Findings

Our findings corroborate previous studies showing that the concept of green consumer product is made of the glass packaging material of local origin, sold by a small firm, and with earth-colored and nature-evoking imagery on the packaging or a non-green consumer product made of plastic packaging by a large company. However, color and imagery are less diagnostic based on the *stimuli* shown. In contrast, packaging materials, origin, and brand characteristics are perceived as more diagnostic since consumers frequently refer to them to decide the product's greenness. Thus, it is apparent that our informants also used as cues of greenness attributes that have limited bearing on actual environmental impact, even though many of them were very familiar with environmental issues.

Responding to the research question of this paper, I first examine the lay theories that seem to guide the greenness assessment; then, I present the reverse lay theory that would explain the non-green evaluation, and I conclude with a remark about its accuracy or inaccuracy.

3.3.1 "If it is traditional, then it is green" lay theory

From sociology I borrow the definition of "traditional," which is described as the established practices or ways of doing before industrialization (Weichselbaum et al., 2009) when the population applied simple and time-honored approaches (Trichopoulou et al., 2007). Industrialization started in 1920 in Europe and after the Second World War in Spain (Bergeaud et al., 2016). When the countries became industrialized, mass production became the norm, and in the following years, globalization started, which may lead to the socio-environmental crisis (Rivaroli et al., 2020; Trichopoulou et al., 2007). This may explain why anything that existed before industrialization is considered greener for consumers, as people seem to believe that if the product existed when there were no environmental problems, the outcome could not have a significant environmental impact; thus, it is green. This is evident when respondent 2 declared. "Now everybody talks about pollution issues, but we have been driving cars since always, and nothing has happened." This quote shows that consumers interpret the greenness of a product by referring to the existence of a time when green problems were unknown to them. For this reason, the first lay theory unveiled can be summarized as "if traditional, then it is green."

This lay theory guides green assessment because consumers make an inter-attribute correlation based on the intuitive relationship between tradition and product cues that convey tradition. This occurs with packaging materials and imagery. As Respondent 4 said:

> *I remember some food came in tins when I was young. Tin is the most sustainable product because of this tradition.*

Similarly, some forms of packaging imagery convey the idea of tradition. As Respondent 17 affirmed:

> *This packaging shows some cookies you would make at home, like the ones you have made all your life.*

In this case, she deems the product greener just because the imagery conveys the idea of traditionality.

The reverse lay theory would be "if new, then it is non-green." This lay theory may explain why consumers resist accepting new packaging materials such as dry carton catches and mixed pouches even though they can have a lower environmental footprint (Steenis et al., 2017). However, both the "If traditional, then it is green" lay theory and its reverse may be inaccurate as showcasing a picture of a traditional product in the packaging does not mean the product has a lower environmental footprint; instead, using this imagery may be interpreted as an opportunity for greenwashing. In the case of packaging materials, the actual environmental footprint is measurable, applying the objective criterion of the Life Cycle Assessment (LCA) (Heijungs et al., 2010) that considers the entire product life cycle and the corresponding environmental footprint and if a product can be recycled or reused. LCA shows that glass is less green than generally believed by consumers, and even a tin is slightly greener than glass (Steenis et al., 2017). However, as glass and cardboard are perceived as traditional materials, they are perceived as greener than they are.

A variant of this lay theory is that "if craft, then it is green." Consumers hold an intuitive relationship between craft production and environmental friendliness and make an inter-attribute correlation between them. As respondent 3 stated, "It is artisanal production; it gives me more security, they handle the production with more care, and it is better for the planet." Crafts are considered more effortful (Cho & Schwarz, 2008), more love is allegedly invested in its production (de Kerviler et al., 2022) and consequently, consumers perceive that the products have a lower environmental footprint (Judge et al., 2020 a,b). This lay theory seems to explicate why consumers pay attention to brand names and packaging imagery, evoking "craft" or "artisanal" production as diagnostic cues and making inferences based on them. To illustrate, informant 8 asserted:

> *The old factory [La Vieja fábrica] is an artisanal firm; for me, the product is green.*

However, this brand belongs to a large food group, and, likely, production could not be artisanal, as the consumer interprets based on the brand name.

The reverse lay theory would be "if industrial, then it is non-green," which is built on an intuitive relationship between industrialized and mass production and a more significant

environmental footprint. Plastic is the epitome of industrialization (Hofmann, 2019) and so is reflected in the interviews: plastic is considered the most polluting material and the primary source of environmental problems; to illustrate, respondent 15 stated, "[t]he most alarming thing is plastic; I have seen many documentaries that say that plastic is lethal for the planet." In my study, products with plastic packaging were immediately categorized as non-green regardless of the other attributes. This implies that consumers perceive plastic packaging as a diagnostic attribute that may lead to biased information processing, when based on LCA different kinds of plastic have disparate levels of ecological impact (Steenis et al., 2017).

3.3.2 "If it reminds me of nature, then it is green" lay theory

I unveiled a second lay theory, drawing from the phenomenon of "natural preference" that relates to a human innate desire or biophilia for the experience of their ancestral environment (Wilson, 1984). Individuals have a naturalness preference based on instrumental reasons (inferred functional superiority) and ideational reasons (due to the moral or aesthetic power of the natural world) (Rozin et al., 2004). However, as Li & Chapman (2012) showed, although purely ideational reasons may exist, part of the ostensible "ideational" naturalness preference is associated with beliefs in the instrumental benefits of natural products. Consumers infer functional superiority (i.e., greener) of natural options compared to non-natural alternatives, leading to the "nature is green" belief. Thus, the second lay theory could be formulated as "if it reminds me of nature, then it is green." Respondents acknowledge that products with nature-based imagery on the packaging were green. To illustrate, to justify why a product was perceived as green, respondent 11 said:

> *The grass, the cows. It reminds me of nature.*

Therefore, "if" a packaging cue reminds consumers of nature, "then" consumers infer that the product is green even when there is no evidence that these cues have associated with a lower environmental footprint. This lay theory would explain why products with earth-colored packaging and packaging with natural imagery are perceived as eco-friendlier (Samaraweera et al., 2021).

Apart from being green, individuals believe that nature is pure (Scott & Rozin, 2020) understanding that purity implies being free from adulteration (Merriam-Webster dictionary, 2022). Respondent 16 acknowledged, "Glass is transparent and could be cleaned and reused." From this and similar quotes, I interpret that product attributes conveying purity - such as glass or white-colored packaging- are also deemed greener (Scott & Vigar-Ellis, 2014).

Also, as nature, per definition, is regenerative (Scott & Rozin, 2020) anything that can be recycled, consuming the least quantity of resources and reconverting into something new, then is green. This lay theory may also explain why some packaging materials – such as glass- are deemed greener than others, as Informant 16 expressed, "[Referring to glass], you can melt it and do it again," despite contradicting evidence from LCA (Heijungs et al., 2010). No reverse theory was applied because the absence of earth-colored and nature imageries is not interpreted as a cue of non-greenness.

In my study, participants who did not socialize in Spain (n=3) spontaneously mentioned natural colors and imagery as cues associated with green products; in contrast, other participants seem to find packaging material and brand names more diagnostic. I interpret this as they were unfamiliar with the brand associations, brand-related cues were uninformative, and their green assessment was based on packaging color and imagery. For instance, respondent 11 explains her interpretation of these cues:

> *The land, the apple, and natural products. Environmental sustainability is always linked with a green or a natural image.*

3.3.3 "If it is from a (perceived) small brand, then it is green" lay theory

The third lay theory focuses on who manufactures the product. Scekic & Krishna (2021) defended that the heuristic smaller is greener guided consumers' categorization of products as green. My findings, however, nuance this statement by showing that objective size is not the diagnostic cue; rather, diagnosticity depends on being symbolically small. This means that regardless of whether the firm is small or large when a company's brand image or brand name is associated with tradition, artisanal practices, locality, and nature, consumers interpret that a small company produces it and the product is green. Respondent 1 said: "[Referring to a big dairy company (Central Lechera Asturiana), from a place cataloged as

a natural site and that the brand name contains the place name], this company is from a natural site, and it is small." However, the firm producing this product is large. This implies that small is not an objective attribute but a symbolic one and is inferred from other cues such as brand name or inferred production methods. Thus, I conclude that brand names evoking local places or using traditional production methods are perceived as green, regardless of the actual size of the firm producing these products (a fact that most consumers ignore). Therefore, the lay theory proposed is "if (perceived) small, then it is green." It is linked to the first lay theory as a consumer believes artisanal firms are usually small. As Respondent 12 stated:

> *[Referring to La vieja fábrica], the brand's name makes me think that they care more for the environment because they are small.*

For all this, I interpret an inter-attribute correlation based on the intuitive relationship between different cues (local place/origin, brand names, brand image) and being perceived as small exists. This lay theory seems prevalent among young individuals who tend to demonize large corporations and associate them with non-green practices. As Respondent 12 pointed out:

> *Usually, the only objective of multinationals is to make profits. There are always cases of people being exploited.*

Also, I find that multiple incompatible theories can coexist side-by-side within an individual; I observed this for a few informants (n=4). On the one hand, they associate small companies with more caring, honest, and traditional practices; based on this perception, they infer that smaller companies are green. On the other hand, they reason that large companies experience more significant market and institutional pressure to remain competitive. As a result of this pressure, they are believed to be more likely to implement pro-environmental production practices. Also, they recognize that implementing these practices requires skills, technology, and financial resources; since it is more likely that large companies have access to these resources, it is also more likely that they have greener practices. To illustrate, these conflicting beliefs are evidenced in the explanation provided by respondent 9. First, he claims:

> *It would be normal to think that the small one will be more sustainable as it cares more for its people, the product, and the quality.*

Later on, in the interview, he states:

> *I take it for granted that this firm [a big multinational of dairy products] cares about the environment and sustainability. That is a contradiction, but the big one is supposed to be right now, the one that cares more for environmental issues because otherwise, they will be expelled from the market.*

Constant comparison across informants reveals that this belief (large companies should be green) was more salient among individuals working in business organizations (respondents 3, 6, 7, and 9).

The reverse theory would be "if it is from a (perceived) large brand, then is non-green" based on an inter-attribute correlation between different cues (brand image, brand names) and being perceived large. The brand image of large companies is associated with large factories that use industrial processes and chemicals and create much pollution. As respondent 14 stated, "Pascual is such a big brand in Spain that will have big factories, creating much waste." Large firms are imagined as producing in large quantities and having diversified portfolios. For this, they resort to mass production, the main reason for the negative environmental impact. This is also supported by the explanation provided by Respondent 9: it is less sustainable because they make tomato soup, orange juice, and other products.

Also, large companies are perceived to be oriented toward economic profit at the expense of sustainability; as informant 14 stated: "Multinational companies focus on mass production to maximize their profits."

Finally, large companies are believed to be more rigid and difficult to change, so it is more difficult for them to adopt sustainability practices, as respondent 13 illustrated: "adoption of sustainability practices means changing the way of doing things, and this is more difficult if you are a large company." However, the "If it is from a (perceived) small brand, then is green" lay theory and its reverse one may be inaccurate since firm size alone has limited bearing on the actual footprint of the product.

To conclude, following an iceberg metaphor, **Figure 7** and **Figure 8** summarize the lay theories that guide consumers' interpretation of iconic cues as a diagnostic of greenness and non-greenness.

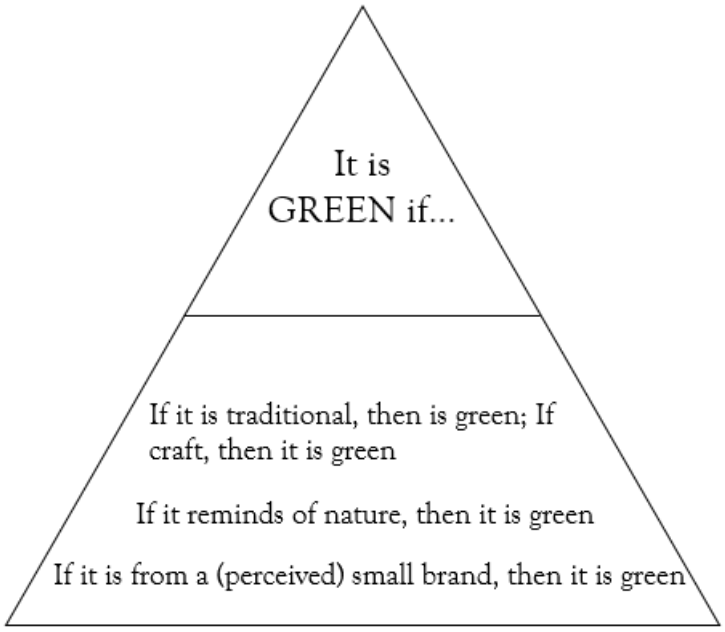


Figure 7. Lay theories of greenness

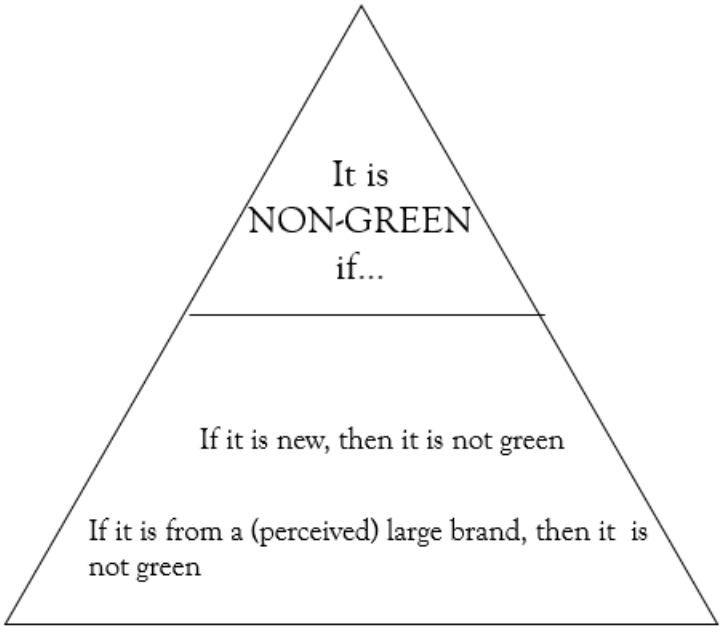


Figure 8. Lay theories of non-greenness

3.4 Discussion

As discussed in chapter 1, in the absence of sustainable claims or eco-labels, consumers consider iconic cues, such as color, imagery, packaging material, origin, and brand characteristics (Autio et al., 2013; Herbes et al., 2018; Herbes et al., 2020; Joshi & Kronrod, 2020; Pancer et al., 2017) to categorize a consumer product as green. Although consumers find these cues diagnostic of greenness, these have limited bearing on the environmental impact of consumer products. As discussed on chapter 2, reliance on lay theories explicates why consumers use these cues as surrogates of greenness. Consumers interpret iconic cues from lay theories and make inferences about greenness based on them (Furnham, 1988; Loken, 2006).

To unveil and label these lay theories, I conducted 21 in-depth interviews. This study explains why that consumers make inter-attribute correlations between white and green packaging colors, natural imagery, materials, local origin, brand features, greenness, plastic, and large companies with non-greenness.

3.4.1 Theoretical contributions

This study makes a threefold contribution to scholarship. First, my findings show that any attribute that conveys traditionality, craftmanship, and naturalness will result in a green product categorization. These attributes will also lead to categorizing the brand as small and consequently as greener (i.e., brand names such as "The old" or "the grandma's" or brands using a local place name). By understanding the lay theories guiding consumers' categorization, I can provide suggestions for easier-to-decipher logos or more cognitively fluent green brand logos. Indeed, the proposed lay theories explain why a round shape and embedded natural images, among other attributes, should be included in the design of a renewable energy sources logo (Keramitsoglou et al., 2020), as these attributes convey naturalness and "humans have developed an inherent tendency to respond positively to natural *stimuli*" (Koivisto et al., 2022). Delving on attributes that convey traditionality, in chapter 4, I investigate why and when traditional methods of production can enhance green perceptions and purchase intent.

Second, my conclusions provide a further explanation of previous studies. Magnier and Crié (2015) identified several cues (color, imagery, and packaging materials) that consumers used to assess greenness and how they drove consumers' preferences. I complement this study by unveiling the influence of lay theories on the attention paid to and the interpretation of these cues by showing that reliance on lay theories of tradition and naturalness explains the diagnosticity of these cues. Steenis et al. (2017) posed that consumers rely on their own lay beliefs and can be easily misled by salient cues that may not be very relevant for objective environmental impacts, as in the case of glass where consumers observed different aspects of eco-friendliness (i.e., recyclability, reusability). I complement this research by offering a fine-grained description of the lay beliefs that can explain why glass is perceived as green. Similarly, Liem et al. (2022) defended that label color (brown cupboard) and material that can be recyclable and or reusable, in combination with consumer beliefs, made consumers perceive a product as environmentally friendly. This study unveils the specific beliefs implicated in perceiving these cues as cues of greenness.

Additionally, Steenis et al. (2017) found that consumers did not assess new packaging materials as green; my findings provide an answer as to why it is the case: if consumers rely on the traditional is greener lay theory, they would categorize new packaging as less green than packaging made of traditional materials such as glass, tin or cardboard. De Feo et al. (2022) posed that consumer misperception of eco-friendliness is caused by a lack of or incorrect communication between the scientific community and citizens, specifically regarding packaging materials. I offer a complementary view presenting the lay theories that must be understood to design educational communication campaigns.

Also, my findings help expand or rethink how specific attributes have been operationalized in past studies. For instance, brand characteristics (Wood et al., 2018) and origin (Lazzarini et al., 2017) have been traditionally operationalized in objective terms, such as company size in sales and distance in kilometers. My study shows that because consumers do not focus on objective attributes, future studies should also test how symbolic attributes may convey smallness or localness.

Lastly, the lay theories identified in this paper may also modulate other consumer schemas, such as categorizing food as healthy. For example, consumers' categorization of healthy

food may be affected by the traditional lay theory (i.e., if a product has always been eaten, it should be healthy because there were no previous health issues); also, reliance on lay theories may explain the resistance to accept new food processing technologies (Etale & Siegrist, 2021).

3.4.2 Limitations and future research lines

Despite this contribution, this study also has some limitations. The qualitative design of this study allowed to unveil the lay theories; however, this study design does not allow for response to other questions such as cue hierarchization, resolution of contradictory cues, the interaction between iconic and indexical cues, or which moderating factors determine the lesser or greater reliance on lay theories. These should be addressed in further studies. As I focus on narrow *stimuli* this might have directed the interview to specific cues, even though my choice is justified by the literature. Conducting further studies considering other *stimuli* and other categories may enrich the understanding. Moreover, in the interviews, it was clear that the packaging material cue was usually mentioned first by consumers to categorize a product as green. This could indicate that cues differ in their diagnosticity, so some cues are central in determining the greenness of a product (Gershoff & Frels, 2015; Sloman et al., 1998)

Further work should discern whether the packaging material is a central attribute that conditions the green assessment (Veryzer, 1999) or whether there could be others. Accepting that products are multi-attribute (Orth & Malkewitz, 2008), future work should study how indexical, iconic cues and other perceptual cues found in communication *stimuli* such as advertising are combined and whether weights are assigned to each of them to make an overall green assessment. Also, more research is needed to understand how consumers evaluate a product's greenness when faced with contradictory iconic and indexical and iconic cues. Finally, my study design did not allow moderating testing variables that could explain the lesser or greater reliance on lay theories.

Chapter 4. Why and when methods of production enhance perceived greenness and purchase intent

4.1 Introduction

Out of the three lay theories unveiled in chapter 3, in chapter 4 I focus in one of them: "if it is traditional, then it is green.". I believe this lay theory is the most interesting one to study given the proliferation of products with traditional method of production cues, especially in the food industry (European Food Information Council, 2017) and the limited research on its implications (Rivaroli et al., 2020). To study this lay theory, in terms of *stimulus* I have chosen packed food within consumer goods due to its relevancy.

In chapter 4, I conceptualize and test the psychological mechanisms by which traditional cues influence perceptions of greenness and its boundary conditions. As production methods shape consumers' perceptions of food (Rivaroli et al., 2020), marketers sometimes style food products to look traditional so that they can be more appealing for consumers. Traditional process elaboration has a halo effect so that the claim of traditionality is often associated with authenticity (Beverland & Farrelly, 2010), superior taste (Chousou & Mattas, 2021; Thurnell-Read, 2019), quality (Siret & Issanchou, 2000), and naturalness (Bryła, 2015) and all these features lead to a higher intention to purchase (Etale & Siegrist, 2021). This halo effect could extend to perceptions of greenness, which in turn would drive consumer preferences (Judge et al., 2020 a,b). However, traditional production methods do not necessarily imply better environmental performance (Richetin et al., 2021). Companies may (in)advertently reinforce lay beliefs by using cues of traditional production methods as a marketing appeal which may be considered as a form of green washing. Therefore, it is essential to know why and under what circumstances traditional production cues convey perceived greenness and purchase intent.

My first objective is to explain the psychological mechanisms whereby traditional production cues lead to perceived greenness and influence consumer preferences. Past work has examined the connection between food production methods and sustainability (Judge et al., 2020 a,b; Rivaroli et al., 2020), concluding that this cue influences consumers' judgments. Other authors (Binninger, 2017; Marozzo et al., 2022; Napoli et al., 2016) have defended authenticity as a mechanism to explain why traditional methods are perceived as greener. Authenticity, in the context of traditional production cues and perceived greenness, can be defined as the degree to which a product or brand is perceived as genuine,

original, and true to its origins or traditional production methods (Ewing et al., 2012). I enrich these cognitive explanations by proposing that a traditional production cue operates by influencing consumer emotions. Specifically, I suggest feelings of groundedness as a mediator. Feelings of groundedness (or groundedness hereafter) refer to a feeling of emotional rootedness, which is achieved through a connection to three distinct yet interconnected sources: one's physical (place), social (people), and historical (past) situations (Eichinger et al., 2022). I defend that traditional production cues create a sense of stability, connectedness, and rootedness, which increases groundedness, which, in turn, positively influences consumers' perceived greenness and purchase intent.

My second objective is to identify under which circumstances traditional production cues elicit these perceptions and preferences, as explained in section 2.3.4 understanding circumstances where lay theories operate is key to achieve a finer knowledge. Specifically, three moderators are examined: category type (vice *vs.* virtue), dispositional nostalgia, and advertising skepticism. To explain the moderating role of these constructs, I draw from two different theories: congruence (Meyers-Levy & Tybout, 1989) and persuasion theories (Petty & Cacioppo, 1984).

The structure pursued in this chapter is the following: first, hypothesis are developed (section 4.2), then method used (section 4.3), following the results (section 4.4), and to finish the discussion, theoretical contributions, limitations and further research (section 4.5). Like in chapter 3, practical contributions will be discussed in the conclusion section of the thesis.

4.2 Hypothesis development

Prior developing a hypothesis, it is necessary to explain the dependent variables. Greenness perceptions and purchase intent are considered separate dependent variables and the relationships between them is not the focus in this study because purchase intent is driven by a combination of various factors such as brand perception, brand reputation, product quality, pricing, nutritional information, and personal preferences (He et al., 2019; Zhuang et al., 2021) that are beyond the scope of this study.

4.2.1 Traditional production methods and consumer perceptions and preferences

Traditional methods are established practices or ways of doing things that date back to before the Second World War (Weichselbaum et al., 2009), when the population applied simple and time-honored approaches (Trichopoulou et al., 2007). Traditional production methods are often treated as an equivalent of craft or artisanal production practices (Rivaroli et al., 2020), and induce positive perceptions of products among consumers. Past work has shown that traditional production methods modulate perceptions of food being perceived as more natural (Etale & Siegrist, 2021), authentic, caring (Judge et al., 2020 a,b), having a superior taste (Chousou & Mattas, 2021; Thurnell-Read, 2019), and quality (Siret & Issanchou, 2000). Moreover, green food is considered natural, safer, and healthier (Schuldt, 2013). In sum, traditional cues have a halo effect on naturalness and healthier, and I hypothesize this halo could extend to greenness perceptions based on the schema or network of meanings associated with traditionality. As discussed in section 2.3.2., the halo effect refers to a cognitive bias where our overall impression of something, in this case food, influences our perception of its other attributes, in this case healthiness or environmental sustainability (Richetin et al., 2021).

I expect that the traditional halo effect extends to perceptions of greenness and drives consumer preferences. Previous studies (Judge et al., 2020 b) concluded that products (in this case ceramics) made using artistic or craft methods received higher ratings in perceived greenness compared to industrially produced products due to this dissemination of expressed affection embedded in the product. Similarly, past work has shown that traditionally produced food is preferred by consumers since they are perceived as more natural and healthier (Etale & Siegrist, 2021). Moreover, consumers have a higher purchase intent of food products made with traditional methods due to the perceived link between higher quality (Canavari et al., 2002; Verbeke & Viaene, 2000) and healthiness (Siegrist & Hartmann, 2020). Consequently, I hypothesize as follows:

> H1a: Traditional (versus Modern) production methods increase consumers' perceived greenness of the product and purchase intent (direct effect)

4.2.2 The mediating role of feelings of groundedness

Former scholarship on groundedness (Nisbet & Zelenski, 2013; Weil, 1952) has been recently applied to the marketing arena by Eichinger et al. (2022). Feelings of groundedness refer to a feeling of emotional rootedness, which is achieved through a connection to three distinct yet interconnected sources: one's physical (place), social (people), and historical (past) situations (Eichinger et al., 2022). Groundedness implies a sense of having a stable foundation and being emotionally securely anchored, which gives consumers a feeling of safety, strength, and stability. Marketing offerings can evoke this experience of groundedness. For instance, products incorporating soundscapes that mimic natural sensations, provide a multisensory experience that enhances the feeling of being rooted in a particular "place"; products manufactured by real people (e.g., bakers) can root you to "people" and remind consumers of their childhood to the "past." Companies can then elicit groundedness in manifold ways. They may elicit place-based groundedness by commercializing their products in farmers' markets that provide that hail from a well-defined location nearby; people-based by featuring individual producers on the packaging, providing information about food suppliers such as their names and addresses, or establishing direct communication channels through company founders or chief executive officers (Fuchs & Hovemann, 2022) and past-based by communicating traditional and artisanal methods, and similarly, publicizing older, often more natural ingredients (Fuchs et al., 2022). Then, the cue of traditional production may elicit feelings of groundedness in consumers (Eichinger et al., 2022). Formally, I hypothesize:

> H1b: Traditional (versus Modern) production methods cues enhance consumers' groundedness

Moreover, I will defend that groundedness will shape the categorization of products as green and drive consumer preferences. Scholarship on affect-as-heuristic theories shows that the emotions experienced by an individual can bias their judgments and decision-making (Keltner & Lerner, 2010). These theories propose that people often rely on their current emotional state as a heuristic or mental shortcut to make judgments and decisions quickly and efficiently (Slovic et al., 2007), as individuals often use their emotional state as a source of information. When individuals experience positive emotions, they may interpret ambiguous information or situations more favorably, while the experience of

negative emotions may lead to more negative interpretations (Loewenstein & Lerner, 2003). Also, emotions can influence the allocation of attention. Strong emotions tend to capture attention and prioritize processing emotionally-salient information. This selective attention can lead individuals to focus on specific aspects of a situation while ignoring others, potentially distorting their judgment (Lerner et al., 2015). Applying these arguments to my study area, I contend that consumers may rely on groundedness to shape their categorization of the product as green and their purchase intent. Because feelings of groundedness will direct attention to a sense of connection, stability, and rootedness with the natural environment and these judgments have been shown to underpin greenness perceptions, feelings of groundedness would drive greenness perceptions. Also, when people find a product that elicits groundedness, they will likely purchase or recommend it (Eichinger et al., 2022). As a result, I put forth the following hypothesis:

H1c: Groundedness increases perceived greenness and purchase intent

4.2.3 The moderating role of category type (virtue/vice)

In the food industry, products can be classified, among others, into vice and virtue categories (Van Doorn & Verhoef, 2015). Vice categories (e.g., potato chips, chocolate, wine, and beer) provide an immediate pleasurable experience but contribute to adverse long-term outcomes for the individual. In contrast, virtue categories (e.g., kefir yogurt, vegetables, fruit) are less gratifying and appealing in the short term but have fewer negative long-term consequences.

Consumers have mental frameworks or schemata associated with specific product categories as discussed in section 2.2. These schemata align and are congruent with certain benefits or perceptions commonly attributed to those categories (Loken et at., 2008). The schemata of virtue categories comprise perceptions of healthiness and care (Ein-Gar et al., 2012; Wertenbroch, 1998), whereas the schemata of vice categories include interpretations of the food item as unwholesome or detrimental to health (Van Doorn & Verhoef, 2011). Products or brands associated with a set of meanings that matches those of the category schemata are accepted by consumers due to perceived congruity (Gao et al., 2022). In contrast, those products or brands that do not correspond with the category schemata may be rejected due to apparent inconsistency. The incongruity of a product can be defined as

the degree of perceived discrepancy between that product and an activated schema in a consumer's mind (Meyers-Levy & Tybout, 1989). To illustrate, consumers perceive an incongruity between vice products and organic extensions because organic is healthy and caring, which is not congruent with vice products (Bezawada & Pauwels, 2013; Hernandez-Olalla et al., 2023). This incongruence results in consumers rejecting organic products in vice categories. Similarly, category incongruity has been shown to explain consumer rejection of sustainability features (associated with perceptions of carness and kindly) in strength categories (i.e., insecticides). In contrast, green products are perceived as congruent with gentleness-dependent categories (Luchs et al., 2012; Mai et al., 2019). These studies show that congruency with the category explain consumer acceptance or rejection of green products based on zero-sum thinking theory (Von Neumann, 1953), where two perceived opposite features (performance and sustainability) cannot be achieved simultaneously.

I hold that both tradition cues and virtue products are congruent because tradition often evokes a deep connection to the land, and consuming virtue products can foster a stronger sense of self-connection and self-care (Jain, Surabhi et al., 2023). Therefore, I defend that consumers will perceive greater congruence when traditional methods cues are found in virtue categories rather than in vice categories. Increased congruence should elicit stronger feelings of groundedness. Consequently, I postulate that combining traditional cues with virtue categories may activate feelings of groundedness (Eichinger et al., 2022) which would indirectly modulate greenness perceptions and consumer preferences. Hence, I formally hypothesize:

> H2: In virtue categories (vs. vice categories) the use of traditional production methods (vs. modern production methods) would increase consumers' feeling of groundedness.

4.2.4 The moderating role of dispositional nostalgia and advertising skepticism

Both dispositional nostalgia and advertising skepticism reflect the influence of individual traits on the relationship between traditional cues and groundedness. While dispositional nostalgia focuses on individuals' emotional attachment to the past and a potential bias in the perception of traditional cues, advertising skepticism delves into consumers' critical

evaluation of advertising claims and their impact on their response to traditional cues. Each moderator is explained in turn.

Nostalgia is a state characterized by a longing for the past, its personalities, possibilities, and events (Barrett & Carter, 2010; Holbrook, 1993). Dispositional nostalgia is a long-term proneness to experience nostalgia frequently and intensely (Sedikides & Wildschut, 2018). Individuals high in this trait tend to have a solid emotional attachment to their past experiences, memories, and people who have been a part of their lives (Sedikides & Wildschut, 2018). Dispositional nostalgia can provide individuals with comfort, connection, and continuity with their past (Baldwin et al., 2015). It can also help them maintain a sense of identity and continuity over time (Hwang & Hyun, 2013). However, dispositional nostalgia can lead individuals to idealize the past and overlook its flaws and negative aspects (Holbrook, 1993). It can also make it difficult for them to engage fully and appreciate the present moment, as they may constantly long for the past (Verplanken, 2012).

Advertising skepticism refers to the tendency of consumers to question or doubt the claims made in advertising, which can impact the chances that consumers will purchase the advertised product (Obermiller & Spangenberg, 1998). Advertising skepticism is not an emotion but a mindset or attitude toward advertising (Obermiller et al., 2005). Consumers may develop advertising skepticism after past experiences with misleading or deceptive advertising or out of a general mistrust of advertising as a persuasive tool or as a result of exposure to conflicting information (Obermiller & Spangenberg, 2000). Factors like information overload, the prevalence of exaggerated or unrealistic claims in advertisements, and concerns about privacy and data manipulation in targeted advertising can also contribute to advertising skepticism (Koslow, 2000).

Drawing on persuasion theories, specifically elaboration likelihood model (Petty & Cacioppo, 1984), I propose that individual traits such as dispositional nostalgia and advertising skepticism can have an impact on feelings. The elaboration likelihood model defends two manners of processing information: the central and the peripheral route (Petty & Cacioppo, 1984). The central route is featured by more effortful processing, assessing all information at hand, and their judgments are less driven by emotions. Engaging in effortful processing requires mental resources such as attention, working memory, and cognitive

effort (Lerner et al., 2015). In contrast, in the peripheral route, consumers do a superficial assessment; their judgment is driven by heuristics, including emotions (Chaiken, 1987). As discussed in section 2.3.4. product involvement affects how cues are processed so that highly involved consumers process *stimuli* more centrally, while in contrast, low-involved individuals engage peripherally and greater emotional influence on cognitive processes (Loken, 2006). Additionally, and biologically speaking, neural basis of nostalgia has been demonstrated recently, specifically how nostalgia involves brain regions associated with self-reflection (Yang et al., 2022). Lay theories will be operating more strongly when information is processed peripherally as discussed in section 2.3.4.

Based on these arguments, I defend that individuals with lesser dispositional nostalgia will process information about production methods more peripherally, and the inclusion of a traditional cue will be used as a heuristic guiding consumer choice. In contrast, individuals with high levels of nostalgia make effortful processing and will not be persuaded by a single nostalgia-evoking cue. Based on this, I propose that nostalgia will moderate the relationship between traditional cues and groundedness. Based on this reasoning, I hypothesize that:

> H3: Nostalgia moderates the relationship between production methods and groundedness so that the greater nostalgia, the weaker the relationship between traditional cues and groundedness.

Along the same lines, skeptical consumers process advertising information more carefully and critically, analyze arguments, and look for evidence before forming an opinion (Obermiller et al., 2005; Smith & Swinyard, 1982). In other words, skeptical individuals have reduced trust in advertising, and they engage in greater scrutiny and critical evaluation of product information (Koslow, 2000). The more skeptical consumers are, the less responsive they will be to persuasive tactics and claims made in advertisements, and the more resistant they will be to advertising appeals (Darke & Ritchie, 2007). Applying this knowledge to my case, I hypothesize that individuals with lower advertising skepticism will not scrutinize traditional method cues and, therefore, will experience greater groundedness because they trust in the claim. In contrast, people with high levels of advertising skepticism may require concrete proof or scientific data to support the claims of traditional production methods (Morel & Pruyn, 2003). If such evidence is lacking or not presented convincingly, their skepticism can lessen the relationship between methods of production and

groundedness. As a result, higher levels of skepticism can weaken the positive relationship between traditional production methods and groundedness.

> H4: Advertising skepticism moderates the relationship between production methods and groundedness so that the greater advertising skepticism, the weaker the relationship between traditional cues and groundedness

Capturing all these hypotheses, **Figure 9** presents my conceptual model.

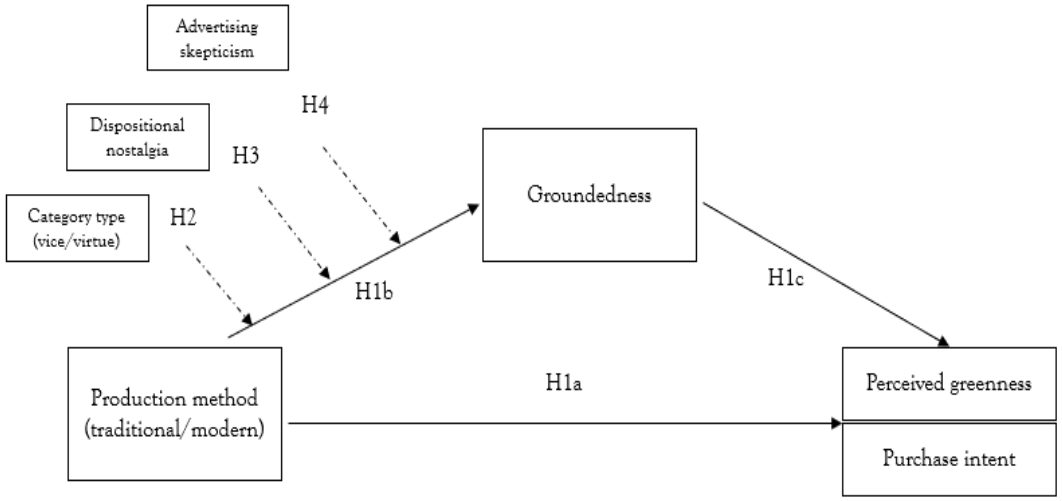


Figure 9. Conceptual model

4.3 Method

4.3.1 Stimuli

An online experiment was conducted. *A priori* power analysis for a two-way ANOVA (main effects and interactions) with a small to medium effect size (.23), power of .90, and alpha of .05 suggested a sample size of 272. Accordingly, I oversampled, reaching 300 respondents to ensure I would reach the required sample size. Of the 300 participants, 20 failed the

attention check, and I removed them from the analysis. Then, I analyzed 280 respondents, which aligns with the *a priori* power analysis.

Participants reviewed one of four fictitious *stimuli* (traditional *vs.* modern production methods) about a kefir yogurt (virtue product) or potato chips (vice product) called "Goodness." They answered a set of questions about it. The online survey software (Qualtrics) allocated participants randomly to one of four *stimuli*. The questionnaire can be found in **Appendix 3**. Fictitious *stimuli* **(Appendix 4)** includes a description and a product picture; both products are shown with no packaging materials but in a white bowl to avoid any bias that can be inferred from packaging materials or colors (Steenis et al., 2017).

As the participants are UK respondents, I ensured that the categories chosen resonated with them. Kefir yogurt was used as a virtue category because it is associated with health benefits by UK consumers (Azizi et al., 2021) and it is a category consumed in the UK (Tesco, 2020). Moreover, kefir yogurt can be produced either via the traditional method or a commercial process (Azizi et al., 2021). Weekly Kefir yogurt consumption was also measured, and 79.6% of respondents reported not consuming the product, 8.5% consuming it once, 7.7% twice, 3.5% three times, and .7 four times per week. Chips were used as a vice category (Van Doorn & Verhoef, 2015). My experiment also measured weekly chip consumption: 8.7% of respondents do not consume it, 23.9% consume it once, 18.8% twice, 20.3 % three times, 10.1% four times, and 18.1% five or more times per week.

4.3.2 Participants

My final sample of analysis comprised 280 participants, all were UK residents above the age of 18 years old, and 51% of the participants were female. In terms of age groups, 29.6% were between 35 and 44 years old, 23.9% of participants were between 25 and 34 years old, 14.3% were between 45 and 54 years old, 13.6% were between 55 and 64 years old, 11.4% above the age of 65 and 7.1% were between 18 and 24 years old. The four scenarios had balanced samples of 68-73 participants each. Gender, age, and education were distributed equally in the four scenarios.

4.3.3 Measures

All measures were based on scales adapted from prior literature and measured on a 7-point Likert scale (1=strongly disagree, 7=strongly agree). Moreover, a pre-test (n=142) examined the psychometric properties of the items. **Table 11** presents an overview of attributes and reliability indicators and **Table 12** descriptive statistics.

Table 11. Attributes overview and reliability indicators

Variable	Item(s)	Factor loading	Cronbach´s Alpha	AVE	Composite reliability
Perceived greenness (adapted from Gershoff & Frels, 2015)	1. This product deserves to be labeled "environmentally friendly." 2. Purchasing this product is a good environmental choice 3. A person who cares about the environment would be likely to buy this product 4. This product is very environmentally friendly	1. .85 2. .88 3. .80 4. .88	.94	.80	.94
Purchase intent (adapted from Dodds et al.,1991)	1. If I were going to purchase a kefir yogurt, I would consider buying this brand 2. If I were shopping for a kefir yogurt, the likelihood I would purchase this brand is high 3. My willingness to buy this brand would be high if I were shopping for a kefir yogurt 4. The probability I would consider buying this kefir yogurt brand is high	1. .84 2. .89 3. .89 4. .81	.94	.81	.94
Feelings of Groundedness (adapted from Eichinger et al., 2022)	1. I feel deep-rooted and firmly anchored 2. I feel connected to my environment 3. I can firmly feel my feet on the ground 4. I feel close to the things, nature, and people that surround me 5. I have a sense of belonging 6. In a metaphorical sense, it makes you feel, as illustrated by the following picture 	1. .88 2. .88 3. .84 4. .85 5. .87 6. .77	.96	.81	.96

Variable	Item(s)	Factor loading	Cronbach´s Alpha	AVE	Composite reliability
Dispositional nostalgia (adapted from Routledge et al., 2008)	1. It gives me pleasure to think about my past. 2. I often think of what I should have done differently in my life. (reversed) 3. On balance, there is much more good to recall than bad in my past 4. I think about the good things that I have missed out on in my life (reversed) 5. Happy memories of good times spring readily to mind 6. The past has too many unpleasant memories that I prefer not to think about (reversed) 7. I get nostalgic about my childhood. 8. I think about the bad things that have happened to me in the past (reversed)	1. .65 2. .74 3. .75 4. .58 5. .76 6. .79 7. .66 8. .68	.83	.41	.83
Advertising skepticism (adapted from Obermiller & Spangenberg, 1998)	1. We can depend on getting the truth in most advertising 2. Advertising is generally truthful 3. Advertising is a reliable source of information about the quality and performance of products 4. I feel I've been accurately informed after viewing most advertisements 5. Most advertising provides consumers with essential information	1. .80 2. .79 3. .76 4. .82 5. .68	.92	.71	.92

Scale: 1 = Strongly disagree; 7 = Strongly agree

Table 12. Descriptive statistics

Variables	**M (SD)**			**Correlations & Fornell and Larcker Criterion**					
	Total sample	*Modern production methods*	*Traditional production methods*	Method of production	Feelings of Groundeness	Dispositional nostalgia	Advertising skepticism	Perceived greenness	Purchase intent
Feelings of Groundeness	3.57 (1.45)	3.16 (1.47)**	3.96 (1.32)**	.27**	**.90**				
Dispositional nostalgia	4.04 (1.04)	4.04 (.93)	4.04 (1.13)	.00	.23**	**.64**			
Advertising skepticism	3.48 (1.26)	3.40 (1.31)	3.56 (1.22)	.06	.48**	.15**	**.84**		
Perceived greenness	4.16 (1.16)	3.98 (1.25)	4.34 (1.04)	.15**	.59**	.16**	.40**	**.89**	
Purchase intent	4.69 (1.30)	4.32 (1.36)**	5,04 (1.14)**	.27**	.57**	.19**	.36**	.52**	**.90**

**p<.01

Feelings of groundedness: t (278)=-4.79, p=.01; Dispositional nostalgia: t (278)=-.03, p=.02; Advertising skepticism: t (278)= -1.02, p=.24; Perceived greenness: t (278)= -2.66, p=.20; Purchase intent: t (278)=-4.84, p=.01

To avoid common method bias, *ex-ante* measures were taken, such as ensuring anonymity and confidentiality in data collection to encourage participants to respond more honestly and accurately (Meade & Craig, 2012); also, items were randomized for each question (Torgerson & Torgerson, 2008) using a computer-generated feature. *Ex post* measures with Harman's Single-Factor Test (Zhonglin, 2020) were calculated and showed not common method bias (36.8% cumulative variance).

To ensure the data quality of my study, I conducted attrition and attention checks (Deeg, 2002). Whereas all respondents completed the test, I removed those who failed to respond to the attention check question. This question was placed in the middle of the questionnaire and it read as follows *How likely would you be to use complex language? Ignore what you have just read and select "Extremely unlikely."* As stated before, twenty participants failed my attention check and were removed from the analysis. By implementing this criterion for removing inattentive participants, I aimed to minimize the potential confounding effects of inattentiveness on my study results (Kung et al., 2018). The decision to exclude these participants was made before any data analysis to maintain the internal validity of my findings. It is worth noting that the results obtained from the remaining sample (n =280) are reported in the subsequent analyses, ensuring that results are based only on attentive participants.

Manipulation checks

Manipulation checks were included for both manipulations. For production methods, three items were used (α =.76). The items were scaled so that higher ratings indicated a higher perception of modern practices (e.g., "This brand relies on modern production methods." from 1 completely disagree to 7 completely agree). Mean differences on the average of the three items demonstrate that the manipulation was effective ($M_{traditional}$ = 4.23, M_{modern} = 5.02; t (278) = 7.09, p <0.01). For category type, two items were used: "In the short term it provides an immediate pleasurable experience but in the long term contributes to negative outcomes" (item 1: vice check) and "In the short term it is less appealing than other products, but in the long-term have positive consequences" (item 2: virtue check). The items were scaled so that lower ratings in item 1 indicated a higher perception of vice and a lower perception of virtue. Mean differences on item 1 demonstrate that this manipulation was

also effective (M_{virtue}= 3.32, M_{vice}= 4.70; t (278)= 8.86, p <0.01), similarly with item 2 (M_{virtue}= 3.78, M_{vice}= 5.06; t (278)= 9.41, p<0.01).

4.3.4 Procedures for the analysis

To test the main effects between the production method and perceived greenness and purchase intent and the mediating role of the feeling of groundedness, I ran a conditional process analysis using PROCESS model 4 for SPSS v.26 (Hayes, 2018) with production methods as an independent variable and groundedness as a mediator. I estimated the model twice, considering perceived greenness and purchase intent as separate dependent variables. I used age, gender, education, and previous consumption of the product as covariates in the analysis. The independent variable was coded 0 for modern and 1 for traditional production methods and 0 for vice products, and 1 for virtue ones. As recommended in the literature, I used 10,000 bootstrap estimations resamples and reported unstandardized coefficients (Hayes, 2018). ANOVA was applied to assess the moderation of category type, and PROCESS model 7 for SPSS v.26 (Hayes, 2018) was used for testing the moderating roles of dispositional nostalgia and green skepticism with the same procedures indicated above.

4.4 Results

When traditional method is displayed, participants exhibit a significant higher purchase intent ($M_{traditional}$ =5.04, M_{modern} =4.32, t (278)= -4.84, p=.01; d =.57) and higher feelings of groundedness *vs.* modern methods ($M_{traditional}$=3.96, M_{modern}=3.16, t (278) = -4.79, p= .01; d=.57). However, greenness perceptions are not greater in products claiming traditional production methods ($M_{traditional}$=4.34, M_{modern}=3.98, t (278)= -2.66, p =.20 d = .31). These results support H1a for purchase intent but not for perceived greenness.

Moreover, virtue products elicit higher purchase intent (M_{virtue}=4.79, M_{vice}= 4.58, t (278) = -1.36, p=.01; d =.16) and higher feelings of groundedness *vs.* vice ones (M_{virtue} = 3.77, M_{vice}= 3.35, t (278)= -2.44, p=.02 d =.29). However, perception of greenness in virtue products is not significant (M_{virtue} = 4,43, M_{vice}=3.89, t (278)=-3,98, p=.89; d=.47). Moreover, a strong and significant relationship between greenness and purchase intent is found (r=.52; p<.01), although they were analyzed as a separate dependent variable as explained in section 4.2.

Reinforcing the first analysis PROCESS model 4 for SPSS v.26 (Hayes, 2018) was used. Results (see **Table 13**) show that when traditional production methods are used, products awaken feelings of groundedness. As a result, H1b is supported. Also, feelings of groundedness enhance both perceived greenness and purchase intent of the product. These results support H1c.

Table 13. Results of PROCESS model 4 for hypothesis 1

	β	**95% LLCI**	**95% ULCI**
Production method → Groundedness	.80*	.46	1.13
R^2 =.09; *F*(5, 274) = 5.45, *p* < .001			
Groundedness→Perceived greenness	.47*	.39	.55
Production Method→Perceived greenness	-.01	-.24	.21
R^2 =.36; *F*(6, 273) = 26.22, *p* < .001			
Groundedness → Purchase intent	.49*	.40	.58
Production Method→Purchase intent	.37*	.46	1.06
R^2 =.36; *F*(6, 273) = 26.15, *p* < .001			
Indirect effect-Perceived greenness	.37	.21	.55
Indirect effect-Purchase intent	.39	.22	.58

*Significant at p< .05

The second hypothesis posited that in virtue categories (vs. vice categories) the use of traditional production methods (vs. modern production methods) would increase consumers' feeling of groundedness. A 2X2 ANOVA with production method (traditional, modern) and product type (virtue, vice) as between-subjects factors shows a non-significant interaction (F (1, 280)=.103, p=.74). Therefore, H2 is rejected, meaning that traditional production methods cues elicit similar feelings of groundedness regardless of the category type

To test the third and the fourth hypotheses (the moderating role of dispositional nostalgia and green skepticism), PROCESS model 7 for SPSS v.26 (Hayes, 2018) was used. Results (see **Table 14**) provide support for a significant interaction between production methods and dispositional nostalgia on groundedness. The direction of the interaction evidences that higher (lower) dispositional nostalgia weakens (strengthens) the positive relationship between the production method and groundedness (r=.47), which supports hypothesis 3. Further analysis of the ranges for moderator variables is used as proposed in Hayes (2018),

which presents 16th, 50th, and 84th percentiles, indicating low, medium, and high values of nostalgia (see **Table 15**). An inflection point is noted so that at very high levels of dispositional nostalgia (>5.04), the relationship ceases to be significant.

Table 14. Results of PROCESS model 7 for hypothesis 3

	β	**95% LLCI**	**95% ULCI**
Production method →Groundedness	2.11*	.80	3.42
Nostalgia → Groundedness	.54*	.29	.79
Production method x Nostalgia	-.32*	-.64	-.01
R^2 = .16; *F*(7, 272) = 7.54, *p* <.001			
Production method →Perceived greenness	-.01	-.24	.21
Groundedness → Perceived greenness	.47*	.39	.55
R^2 = .36; *F*(6, 273) = 26.22, *p*<.001			
Production method →Purchase intent	.37*	.11	.63
Groundedness → Purchase Intent	.49*	.40	.58
R^2 = .36; *F*(6, 273) = 26.15, *p* <.001			

*Significant at p<.05

Table 15. Influence of traditionality cue on groundedness conditioned by nostalgia.

Nostalgia level	Conditional Effect	Lower boundary	Higher boundary
Low (0-3)	1.12*	.66	1.58
Medium (3.01-4.12)	.75*	.43	1.07
High (4.12-7)	.42	-.04	.89

*Significant at p<.05

Johnson-Neyman significance region = 5.04; Lower boundary=-.19 and higher boundary= 1.78

Furthermore, the moderated mediation index is significant at p<.05 for purchase intent (index= -.16; CI from [-.33 to -.0006]) but not significant for perceived greenness (index= -.15; CI from [-.32 to .0051]). Nonetheless the index of moderated mediation becomes marginally significant for perceived greenness at p=.1 (index= -.15; CI from [-.29 to -.02]) .

Conducting the same analysis for advertising skepticism (hypothesis 4), I observe a significant relationship (see **Table 16**) between skepticism and groundedness so that higher (lower) advertising skepticism weakens (strengthens) the positive relationship between the

production method and groundedness (ß=.55); however, the relationship between production methods and skepticism on groundedness is non-significant (r=-.38), and therefore H4 is not supported. As a summary **Table 17** presents a synopsis of the hypothesis and the results.

Table 16. Results of PROCESS model 7 for hypothesis 4

	β	95% LLCI	95% ULCI
Production method → Groundedness	.86*	.009	1.71
Skepticism → Groundedness	.55*	.39	.71
Production method x Skepticism	-.38	-.26	.19
R^2 = .30; *F*(7, 272) = 17.02, *p*<.001			
Production method → Perceived greenness	-.01	-.24	.21
Groundedness → Perceived greenness	.47*	.39	.55
R^2 = .36; *F*(6, 273) = 26.22, *p*<.001			
Production method →Purchase intent	.37*	.11	.63
Groundedness → Purchase Intent	.49*	.40	.58
R^2 = .36; *F*(6, 273) = 26.15, *p*<.001			
Direct effect-Perceived greenness	-.01	-.24	.21
Direct effect-Purchase intent	.37*	.11	.63

*Significant at p< .05

Table 17. Summary of hypotheses and results

Hypothesis	**Results of the experiment**
H1a: Traditional (*vs.* Modern) production methods increase consumers' perceived greenness of the product and purchase intent (direct effect).	Supported for purchase intent. Rejected for perceived greenness
H1b: Traditional (*vs.* Modern) production methods cues enhance consumers' feelings of groundedness.	Supported
H1c: Feeling of groundedness increases perceived greenness and purchase intent.	Supported
H2: In virtue categories (*vs.* vice categories) the use of traditional production methods (vs. modern production methods) would increase consumers' feeling of groundedness.	Rejected
H3: Nostalgia moderates the relationship between production methods and groundedness so that the greater nostalgia, the weaker the relationship between traditional cues and groundedness.	Supported
H4: Advertising skepticism moderates the relationship between production methods and groundedness so that the greater advertising skepticism, the weaker the relationship between traditional cues and groundedness.	Rejected

4.5 Discussion

This study aims to expand the growing literature on traditional production methods by examining the psychological mechanisms explaining how this cue drives green consumer perception and purchase intent and the moderators of this relationship. Specifically, focusing on packed food products, the experiment's results shed light on the mediating role of emotions, through consumer feelings of groundedness, in the relationship between consumers' perception of greenness and their purchase intent for packaged food produced using traditional methods. Contrary to our hypothesis, the study revealed that participants did not directly perceive products made through traditional production methods as environmentally friendly when compared to those made with modern techniques.

However, this perception of eco-friendliness can be achieved through the mediation of groundedness, which involves establishing a strong connection between the product and its production process, particularly by emphasizing the product's ties to nature or the land. Zhao et al., (2010) documented how indirect effect can be significant in the absence of a direct effect calling it as indirect-only mediation based on the mediation identified consistent with hypothesized theoretical framework.

Furthermore, the research showed that traditional production methods led to a higher purchase intent among consumers. This finding suggests that consumers might view products made using traditional methods as more desirable or of higher quality, which could impact their purchasing decisions positively.

I also tested boundary conditions of this effect (traditional methods cues increase groundedness) on category type (virtue or vice), concluding that traditional production methods cues elicit similar feelings of groundedness regardless of the category type. In the absence of conclusive empirical evidence, I could engage in speculative analysis, and formulate new hypotheses or conjectures based on available information, such traditional cues on virtue products could foster a sense of self-connection and self-care (Jain et al., 2023) that elicit groundedness. And also, traditional cues on vice products can act as a neutralizer to appease consumer guilt (Van Doorn & Verhoef, 2015) and elicit groundedness. Therefore, the mechanism to explain why traditional methods employed in both virtue and vice categories elicits groundedness could extend to other emotions that could be studied in future research lines.

This study also demonstrates the moderating role of nostalgia: the relationship between traditional cues and groundedness is inversely related to the level of nostalgia. As nostalgia increases, the connection between traditional cues and groundedness weakens. Contrary to expectations, advertising skepticism was not found to be a significant moderator of groundedness. A plausible explanation for this result is that contextual factors, such as personal values, and previous experiences (Mishler & Rose, 2001), could override the influence of advertising skepticism. Therefore, the relationship between traditional cues, groundedness, and advertising skepticism may be complex. Future work could examine how these factors influence the focal relationship.

4.5.1 Theoretical contributions

This paper makes two contributions to the sustainable consumption literature. First, whereas former literature on traditional production methods evidence that traditional process elaboration is often associated with perceptions of greenness because more love is allocated (Judge et al., 2020 a,b), I nuance this statement and extend the analysis studying packed foods. A possible explanation for this difference could be that the product type may act as a potential moderator affecting the influence of production methods. Judge et al., (2020, b) tested distinct vessel materials, namely wooden and metal bowls and in this case, the significance of traditional creation history is key. Whereas my experiment presented packed foods (kefir yogurt and potato chips) normally commercialized in supermarkets and produced massively. Additionally, my study enriches recent work by Eichinger et al. (2022), introducing a new outcome of groundedness, that is, perceived greenness. Groundedness explains the psychological process behind the relationship between tradition production methods and green perception and presents a complementary emotional explanation to perceived authenticity as the mechanism underpinning the influence of traditional cues on consumer preferences (Marozzo et al., 2022; Napoli et al., 2016).

Second, I contribute to the sustainable consumption literature showing that when individuals rely more (less) on lay theories, as discussed in section 2.3, they engage in peripherical (central) route processing, with a less (more) careful consideration of information, they increase (reduce) their reliance on traditional cues, leading to less (more) critical evaluation and an increased (decreased) trust (susceptibility) to traditional cues, which is the case for individuals with low (high) predisposition nostalgia.

4.5.2 Limitations and future research lines

This study has limitations that result in avenues for future research. First, while the study suggests that traditional production cues and emotional appeals can positively influence consumer behavior, it is crucial to recognize that their effectiveness may vary across product types, cultural differences, or target audience characteristics that may impact the degree to which traditional production methods resonate with consumers. For example, my study focuses on two specific product and this fact could have impact the results. Testing other food and non-food categories, such as fashion and apparel where traditional production

cues encompass design specifications, fabric selection, sewing techniques, and assembling finished products (Gwilt & Rissanen, 2012) could be addressed in future research lines.. Regarding target audience characteristics, although demographic variables (age, gender, education) and psychographic variables (nostalgia and skepticism) are considered in the experiment, further psychographics factors such as lifestyle, values or attitudes could be included in additional studies.

Second, this study focused solely on the interaction between production methods and psychographic variables (nostalgia and skepticism) neglecting other potential factors that could influence perceived greenness and purchase intent. Further research could consider pricing, convenience, brand reputation, and product perceived quality as other moderators of traditional production methods.

Third, in former research, authenticity and, in my experiment, groundedness have been identified as mechanisms to explain the higher intention to purchase products portraying traditional cues. Moreover, other emotions, such as trust and warmth, can be studied. Traditional production methods are often associated with craftsmanship, attention to detail, and quality (Judge et al., 2020 a,b) and this can instill a sense of trust in consumers, as they perceive traditional cues as reliable indicators of product excellence. Both, trust-related emotions (Chen & Chang, 2013) such as confidence, reassurance, and reliability and warmth-related emotions (Cuddy et al., 2008) such friendly, well-intentioned, and having positive intentions toward others could mediate the effect of traditional production cues on purchase intention and could be examined further.

Additionally, traditional production methods can evoke a sense of pride in consumers who value heritage, craftsmanship, and supporting local or traditional industries (Rivaroli et al., 2020). When consumers perceive traditional cues in products, they might feel proud to associate themselves with such items' cultural or historical significance. Anticipated pride could then influence their intention to purchase products made through traditional methods.

Conclusions

The thesis contributes to the current scholarship on sustainable consumption in three ways. First, I present an integrative theoretical framework explaining the processes involved in categorizing products as green. The integrative theoretical framework proposed represents a foundation for future research offering actionable research directions that can extend our understanding of consumers' categorization of green consumer products.

Second, I contribute to scholarship on the categorization of green products by showing that seemingly isolated and disparate cues are, in fact, interconnected, as they are all linked to three lay theories used by consumers to assess products as green. This interconnection idea shows an advantage over existing understanding because it goes beyond surface-level cues and reveals the underlying cognitive processes and mental frameworks consumers employ when making judgments about product sustainability and could be object of future studies. I expand this stream of literature by explaining the mechanisms that underline categorization specifically I show that lay theories shape the formation of the green concept and have a role in categorization and decision-making. As such, gaining insights into these lay theories is critical for comprehending the reasons behind the association of specific attributes (i.e., produced locally and sold by a niche or/and small brand) with greenness perceptions.

Third, this thesis adds to the growing research on lay theories and their influence on consumer preferences and cognitions. My focus on the emotional mechanisms mobilized by these lay theories enriches explanations for how lay theories influence consumers. Whereas Haws et al. (2017) and Mai & Hoffman (2015) focused on cognitive mechanisms, my work foregrounds that lay theories also mobilize emotions. Haws et al. (2017) studied the "if it is healthy, then it is expensive" lay theory that impacts a variety of variables related to food decision-making, including inferences, judgment, choice, and information search. They based on dual process models to explain how intuition acts as a bias in shaping how consumers process information about health and price when consumers are processing heuristically. Mai & Hoffman (2015) examined the potential of health consciousness to resolve the so-called "if it is unhealthy, then it is tasty" lay theory. Their results show that health consciousness operates only through cognitively controlled processes, and the lay theory partly works implicitly and independently of health consciousness. Neither of these

key articles, however, has addressed the role of emotions. I highlight the role of emotions in lay theories.

These contributions further open a normative debate around the risk of greenwashing and consumer mislead using iconic cues. This debate can be addressed in the Business Ethics and Corporate Social Responsibility literatures. Whereas there is regulation guiding the use of indexical cues on packaging (i.e., product certification), the use of iconic cues must be included in existing codes. This work shows the potential confounding or greenwashing effect for consumers by including cues such as tradition, colors, and brand names that convey craftmanship.

As presented in this thesis, categorizing a product as green is consequential, and several stakeholders, beyond academics, are impacted by my findings. Therefore, I conclude by presenting practical contributions to consumer organizations, policymakers, marketers, and education institutions, especially in the marketing field.

Consumer organizations are crucial in the ongoing shift towards environmentally responsible consumption. In today's world, where environmental concerns are paramount, it is key that these organizations equip consumers with the knowledge necessary to make informed decisions about green products. One of the primary challenge's consumers face is the pervasive influence of lay theories in shaping their perceptions of green products. These lay theories often stem from preconceived notions and misconceptions, potentially leading consumers down the wrong path when making eco-conscious choices. Consumers must recognize and understand the impact of these lay theories on their perceptions of greenness, as elucidated in chapters 3 and 4. Chapters 3 and 4 serve as an essential reminder of the significant role that lay theories can play in shaping consumer choices. If consumers are not vigilant in acknowledging and mitigating the effects of these lay theories, they risk making suboptimal and unsatisfactory decisions, thus perpetuating environmentally harmful choices (Pickett-Baker & Ozaki, 2008).

Consumer organizations have a unique opportunity to bridge this knowledge gap. They can design and implement training programs that educate consumers and capture their attention effectively. It has been well-documented that novel information can captivate the human mind, making it an excellent tool for promoting deeper information processing (Mai et al., 2019). These training programs can encompass various topics, ranging from the

environmental impact of various products to adopting sustainable lifestyles. By providing consumers with accessible and engaging content, consumer organizations can stimulate a greater understanding of what it truly means to be green. This heightened awareness can then lead to more informed decision-making. In conclusion, consumer organizations bear the responsibility of educating consumers about making environmentally friendly decisions. Through awareness of the impact of lay theories on greenness perceptions, consumers can reduce the likelihood of making suboptimal choices. These organizations pave the way for a more sustainable and eco-conscious society by employing strategies to capture attention and encourage systematic information processing. Ultimately, this knowledge empowers individuals to make choices that benefit themselves and the planet.

Policymakers are urged to take proactive steps towards fostering a greener future. Central to this endeavor is the need for awareness raising campaigns about what green and traditional methods do and do not entail, for promoting business transparency, regulating marketing practices, and fostering innovation while preserving the environment. One fundamental aspect of the transition towards sustainability is awareness. Citizens often need a comprehensive understanding of what green practices entail. To bridge this knowledge gap, policymakers must invest in effective awareness raising campaigns with accessible language to be understood by consumers.

Furthermore, raising awareness about sustainability extends beyond individuals to businesses. Companies play a pivotal role in shaping environmental outcomes. Policymakers should work with corporations to encourage a shift towards eco-conscious practices. This entails promoting transparency in business operations. As discussed before, the use of iconic cues in packaging is not regulated. Policymakers should prevent misleading or deceptive marketing and appeal to companies' sense of responsibility, compelling them to use ethically iconic cues. This last point leads us to discuss implications for companies.

In today's increasingly environmentally-conscious world, marketers face a significant challenge and responsibility: to provide substantiated information about their product's environmental benefits, to align packaging cues with their actual sustainability practices, and to avoid engaging in the deceptive practice known as "greenwashing." This call for transparency and authenticity is not just a moral obligation; it has become crucial to build trust with consumers and ensuring long-term success in the market. First and foremost,

consumers are now more concerned about the environmental impact of their purchases than ever before. They are seeking eco-friendly products and demanding evidence to substantiate what companies show on the pack. Marketers, therefore, must be prepared to provide robust and verifiable data supporting their product's environmental iconic cues. This may involve sharing information about the product's lifecycle, sourcing sustainable materials, or origin. By doing so, marketers can establish trust with consumers who value authenticity and honesty. In this respect, little is known about the literacy of brand managers and marketing directors on what environmental sustainability entails, if they are aware of life cycle assessment, and if they hold the same lay theories as consumers. Recent research (Herbes et al., 2023) points out that European brand managers are not aware about life cycle assessment. In this respect, further research is needed.

Avoiding greenwashing is the most significant ethical imperative for marketers today, and packaging must not be a mere facade. Marketers should ensure that the iconic packaging cues align with the product's entire lifecycle, from production to disposal. To help marketers align iconic packaging cues with current sustainability practices, this thesis provides insights to create a training course for brand managers to ensure that their iconic cues on the packaging are accurate, specific, backed by evidence, and thus avoid greenwashing. Moreover, companies should be open to criticism and willing to make improvements based on consumer feedback and evolving environmental standards. In a world where information spreads rapidly through social media and online reviews, the consequences of greenwashing can be swift and severe. In conclusion, marketers are not just selling products; they are selling values, ethics, and promises of a better world. To fulfill this role responsibly, they must provide substantiated information about their product's environmental benefits, ensure that packaging aligns with their sustainability practices, and avoid the pitfalls of greenwashing.

Lastly, education institutions play a pivotal role in shaping the future of marketing professionals by imparting essential knowledge and skills, with a particular emphasis on ethical practices. The findings of these two studies can help education institutions train their students about how consumers categorize consumer goods as green without indexical cues, the potential misuse of this information and how marketers need to be made aware of what consumers consider green. Future marketing students should be exposed to these

insights and encouraged to use them with honest, transparent, and responsible advertising to critically analyze and understand the consequences of their decisions when they design iconic packaging cues.

By emphasizing ethical practices in marketing education, institutions should educate graduates who will be able both to excel in their marketing roles and contribute positively to society. These future marketers would have the knowledge and skills to develop marketing communications and product development strategies that resonate with consumers and build brand trust. Ultimately, educational institutions play a vital role in shaping the future of marketing by ensuring that ethical principles are at the core of every marketer's skillset.

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Appendixes

Appendix 1: Semi structured interview guide

Good morning/afternoon and thank you very much for taking the time to help me with my PhD field research.

I want to start giving you some legal information regarding data protection.

The treatment of all the information collected during this interview is anonymous, the information is stored under a pseudonym and will be used exclusively for my PhD study. I need you to sign the data consent within the protocols of the University that I'm serving my PhD. This interview has neither any benefit nor risk for you and you can leave it at any time.

I would like to ask for your consent to take pictures and record this conversation, as this would make it easier for me to analyze the data later. I will also take some small notes during the conversation, hope this is fine for you.

This interview is a study of perceptions on sustainably, there are not good or bad answers, so I ask you to be honest and objective. Again, rest assured that the content of the interview is anonymous and used only for my PhD study.

Any questions? Shall we start? All the questions I am going to ask are referred only to packed goods.

Phase1: Open approach

Regarding lifestyle: at what extent are you concerned of environmental issues? Are you taking any actions in your daily routine to contribute to environmental sustainability?

When you go shopping, what criteria do you use to buy packed goods (food and cleaning products)? Do you follow a shopping list or buy more by impulse? What do you care about when you buy packed goods? What do you pay attention to?

What kind of packed goods do you buy? Can you give me some examples packed goods you have bought lately?

Among the products you mentioned, have you noticed if there were any sustainable products?

For you, what does sustainability means? How do you assess if a product is environmentally sustainable/green? What elements of a product make you think it is eco-friendlier than another, regardless if you buy it or not?

I am going to show you some pictures, and I need you to classify them based on what you believe that is more or less eco-friendly. Then I will ask you why you have though like this, why again…

Appendix 2. Pictures used in qualitative research

Group 1: Same Brand and different packaging materials

Group 2: Same packaging materials and different brand

Group 3: Different packaging materials and different brand

Appendix 3. Qualtrics survey questionnaire

PROLIFIC_PIDValue will be set from Panel or URL.
Block: Consent questions (3 Questions)
Branch: New Branch If Please confirm the following: I am over the age of 18 - No Is Selected
EndSurvey: Advanced
BlockRandomizer: 1 - Evenly Present Elements
Standard: Trad Kefir (16 Questions) Block: Trad Crisps (16 Questions) Block: Modern Crisps (16 Questions) Block: Modern Kefir (16 Questions)
EndSurvey: Advanced

Q1 You are invited to take part in a research study into methods of production perceptions. Before you decide, it is important for you to understand what research is being done and what it will involve.

Please take time to read the following information carefully and discuss it with others if you wish. Ask the research team if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part.

Thank you for reading this.

Approval has been obtained from the Research Ethics Committee at Pontificia Comillas University for data collection.

Principal investigator: Professor Arancha Larranaga

Why have I been invited to participate?

You are a member of an online consumer panel, employed for the data collection. You are eligible to take part in this research if you are (1) over 18 years of age and (2) you current live in the UK.

What will happen to me if I take part?

This study will involve you reading and making judgements about a fictional scenario. There are no right or wrong answers, I am interested in your personal opinion.

The study will take approximately 13 minutes for you to complete. Much of this time will involve you indicating your attitudes and perceptions after reading the fictional scenario.

Please read the Participant information sheet before proceeding

Q2 Please confirm the following:

	Yes (1)	No (2)
I have read the Participant Information Sheet included with this questionnaire. (1)	○	○
I am over the age of 18 (2)	○	○
I understand that no personal identifying data is collected in this study, therefore I know that once I have submitted my answers I am unable to withdraw my data from the study (3)	○	○
I agree to take part in this study (4)	○	○

Skip To: End of Survey If Please confirm the following: = I am over the age of 18 [No]

Q3 Please provide your prolific ID below. It is very important that you correctly type your ID, including capital letters and numbers. We might not be able to reward surveys that do not contain a correct Prolific ID which matches existing records.

Q104 Below is the description of a product and its production method. Please read the description carefully as we will ask you questions about it. You will not be able to access this screen again so it is important that you read the description carefully. It will take approximately 20 seconds to read the description and you will be able to advance after you have read it.

Q106 Given what you have read, to what extent do you believe the company producing **Goodness kefir yogurt (one of the four *stimuli*)** is:

Q106 Given what you have read, to what extent do you believe the company producing Goodness kefir yogurt is:

	Strongly disagree (1)	Disagree (2)	Somewhat disagree (3)	Neither agree nor disagree (4)	Somewhat agree (5)	Agree (6)	Strongly agree (7)
Capable (1)	○	○	○	○	○	○	○
Competent (2)	○	○	○	○	○	○	○
Efficient (3)	○	○	○	○	○	○	○
Skillful (4)	○	○	○	○	○	○	○
Industrious (5)	○	○	○	○	○	○	○
Intelligent (6)	○	○	○	○	○	○	○
Friendly (7)	○	○	○	○	○	○	○
Likeable (8)	○	○	○	○	○	○	○
Kind (9)	○	○	○	○	○	○	○
Nice (10)	○	○	○	○	○	○	○
Warm (11)	○	○	○	○	○	○	○
Reliable (12)	○	○	○	○	○	○	○

Q107 Given what you have read, you would perceive this Goodness kefir yogurt is:

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
Non-natural	○	○	○	○	○	○	○	Natural
Unhealthy	○	○	○	○	○	○	○	Healthy
Untasty	○	○	○	○	○	○	○	Tasty

Q66 Please indicate the extent to which you agree with the following statements

	Strongly disagree (1)	Disagree (2)	Somewhat disagree (3)	Neither agree nor disagree (4)	Somewhat agree (5)	Agree (6)	Strongly agree (7)
This product deserves to be labeled "environmentally friendly" (1)	○	○	○	○	○	○	○
Purchasing this product is a good environmental choice (2)	○	○	○	○	○	○	○
A person who cares about the environment would be likely to buy this product (3)	○	○	○	○	○	○	○
This product is very environmentally friendly (4)	○	○	○	○	○	○	○

Q67 Please indicate the extent to which you agree with the following statements

	Strongly disagree (13)	Disagree (14)	Somewhat disagree (15)	Neither agree nor disagree (16)	Somewhat agree (17)	Agree (18)	Strongly agree (19)
We can depend on getting the truth in most advertising (1)	○	○	○	○	○	○	○
Advertising is generally truthful (2)	○	○	○	○	○	○	○
Advertising is a reliable source of information about the quality and performance of products (3)	○	○	○	○	○	○	○
I feel I´ve been accurately informed after viewing most advertisements (4)	○	○	○	○	○	○	○
Most advertising provides consumers with essential information (5)	○	○	○	○	○	○	○

Q109 Please indicate how likely you find the following statements

	Extremely unlikely (1)	Moderately unlikely (2)	Slightly unlikely (3)	Neither likely nor unlikely (4)	Slightly likely (5)	Moderately likely (6)	Extremely likely (7)
If I were going to purchase a kefir yogurt, I would consider buying this brand (1)	○	○	○	○	○	○	○
If I were shopping for a kefir yogurt, the likelihood I would purchase this brand is high (2)	○	○	○	○	○	○	○
My willingness to buy this brand would be high if I were shopping for a kefir yogurt (3)	○	○	○	○	○	○	○
The probability I would consider buying this kefir yogurt brand is high (4)	○	○	○	○	○	○	○

How likely would you be to use complex language? Ignore what you have just read and select "Extremely unlikely" (5)	

Q110 Please indicate the extent to which these descriptions are characteristic of you or not:

	Far too little (1)	Moderately too little (2)	Slightly too little (3)	Neither too much nor too little (4)	Slightly too much (5)	Moderately too much (6)	Far too much (7)
It gives me pleasure to think about my past (1)	○	○	○	○	○	○	○
On balance, there is much better to recall than bad in my past. (2)	○	○	○	○	○	○	○
Happy memories of good times spring readily to mind. (3)	○	○	○	○	○	○	○
I get nostalgic about my childhood. (4)	○	○	○	○	○	○	○
I often think of what I should have done differently in my life. (5)	○	○	○	○	○	○	○
I think about the good things that I have missed out on in my life. (6)	○	○	○	○	○	○	○

The past has too many unpleasant memories that I prefer not to think about. (7)	○	○	○	○	○	○	○
I think about the bad things that have happened to me in the past. (8)	○	○	○	○	○	○	○

Q111 Based on what you have read, please indicate your perception of the company size manufacturing Goodness kefir yogurt

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
Very small	○	○	○	○	○	○	○	Very large

Q112 Given what you have read, to what extent do you believe this Goodness kefir yogurt make you:

	Strongly disagree (1)	Disagree (2)	Somewhat disagree (3)	Neither agree nor disagree (4)	Somewhat agree (5)	Agree (6)	Strongly agree (7)
Feel deep-rooted and firmly anchored (1)	○	○	○	○	○	○	○
Firmly feel my feet on the ground (2)	○	○	○	○	○	○	○
Have a sense of belonging (3)	○	○	○	○	○	○	○
Feel close to the things, nature and people that surround me (4)	○	○	○	○	○	○	○
Feel connected to my environment (5)	○	○	○	○	○	○	○
In a metaphorical sense: make you feel as illustrated by the following picture (6)	○	○	○	○	○	○	○

Q113 How much kefir yogurts do you eat per week on average?

- ○ None at all (1)
- ○ 1 (2)
- ○ 2 (3)
- ○ 3 (4)
- ○ 4 (5)
- ○ 5 or more (6)

Q114 Based on what you have read, please indicate your impression when someone consumes kefir yogurt

	Strongly disagree (1)	Disagree (2)	Somewhat disagree (3)	Neither agree nor disagree (4)	Somewhat agree (5)	Agree (6)	Strongly agree (7)
In the short term it provides an immediate pleasurable experience but in the long term contributes to negative outcomes (1)	○	○	○	○	○	○	○
In the short term it is less appealing than other products, but in the long-term has positive consequences (2)	○	○	○	○	○	○	○

Q115 Please indicate the extent to which you agree with the following statements

	Strongly disagree (1)	Disagree (2)	Somewhat disagree (3)	Neither agree nor disagree (4)	Somewhat agree (5)	Agree (6)	Strongly agree (7)
This brand relies on modern production methods (1)	○	○	○	○	○	○	○
This brand uses age-old recipes (2)	○	○	○	○	○	○	○
The fermentation process is done accordingly to contemporary work practices (3)	○	○	○	○	○	○	○
This brand is based close to where I live (4)	○	○	○	○	○	○	○
I would consider this as a local brand considering where I live (5)	○	○	○	○	○	○	○

Q116 Your age

- 18 - 24 (1)
- 25 - 34 (2)
- 35 - 44 (3)
- 45 - 54 (4)
- 55 - 64 (5)
- 65 - 74 (6)

Q117 Your sex

- Male (1)
- Female (2)

Q118 Please indicate the highest education level you have attained.

- High school graduate (1)
- Vocational college (2)
- Some college (3)
- Bachelor's degree (4)
- Master degree (5)
- Doctorate (6)
- Professional degree (7)

Appendix 4. *Stimulus* used in the experiment.

Goodness kefir yogurt is a dairy product made following traditional production methods.

It uses age-old recipes.

The fermentation process is done according to long-established work practices

Goodness kefir yogurt is a dairy product made following modern production methods.

It uses recent recipes

The fermentation process is done according to contemporary work practices.

Goodness Crisps is a potato chip made following traditional production methods.

A selection of the best potatoes is cut according to traditional manual processes.

The potato chip production process is done according to long-established work practices.

Goodness Crisps is a potato chip made following modern production methods.

A selection of the best potatoes is cut according to modern automated processes.

The potato chip production process is done according to contemporary work practices.