Consumers' sustainability perceptions: Studies on conceptualization, drivers, and consequences in consumer behavior

Dissertation to obtain the doctoral degree of Economic Sciences (Dr. oec.)

Faculty of Business, Economics and Social Sciences

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submitted by

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2024

Date of Disputation: August 22, 2024

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Danksagung

Den erfolgreichen Abschluss meiner Promotion möchte ich als Gelegenheit nutzen, um allen meinen herzlichen Dank aussprechen, die zum Gelingen dieser Dissertation beigetragen haben.

Mein besonderer Dank gilt meiner Betreuerin Prof. Dr. Verena Hüttl-Maack, für die fachliche Unterstützung, die Anregungen, Ideen und wertvollen Diskussionen während dieses Prozesses. Danke für die Unterstützung und Begleitung während der letzten Jahre!

Danke an die Prüfungskommission für die Begutachtung meiner Dissertation.

Ebenso danke ich allen meinen Ko-AutorInnen für den inspirierenden Austausch und die gute Zusammenarbeit. Ganz besonders möchte ich dabei Stefanie Fella danken, auf deren Unterstützung ich immer zählen konnte.

Nicht zuletzt gilt mein tiefster Dank meiner Familie und meinen Freunden, die mir immer zur Seite standen und jederzeit ein offenes Ohr hatten.

Abstract

Consumers' individual perceptions have a profound influence on their decisions and behaviors in various areas of consumption, including sustainable consumption. Despite considerable research on sustainable consumer behavior, consumers' sustainability perceptions continue to be insufficiently understood. Typically, researchers predefine and manipulate sustainable product or brand attributes and then examine their direct influence on consumer reactions without integrating their sustainability perceptions. It therefore remains largely unclear what constitutes consumers' sustainability perceptions and what role they play in the consumption context.

This research gap has particularly severe consequences in the area of sustainable consumer behavior, as the perceptual process is not only determined by individual characteristics of the consumer (i.e., values, attitudes, or motivations) but also strongly by the specifics of the topic of sustainability itself. For consumers who are non-experts, sustainability is an abstract and complex topic that is difficult to grasp.

In addition, the sustainability of specific types of behavior, products or brands is usually a credence attribute and cannot be directly observed or ascertained. As a result, consumers' sustainability perceptions often differ from actual sustainability as measured by objective criteria. However, consumers' subjective sustainability perceptions is what ultimately shapes their consumption decisions. Therefore, to better understand sustainable consumer behavior, consumers' sustainability perceptions need to be included in research approaches.

In addition, sustainability perceptions are of great importance in business practice. If sustainable products or brands have a high level of actual sustainability, but are not perceived as sustainable by consumers, they fail to realize their potential. Conversely, products or brands that are not actually sustainable but are perceived as such by consumers risk damaging their reputation if they are exposed as greenwashers.

This dissertation addresses this gap by delving into the multifaceted nature of consumers' sustainability perceptions, focusing on both the product and brand level. Its key aim is to advance knowledge on the conceptualization of consumers' sustainability perceptions as well as their drivers and consequences. In doing so, the focus lies on how sustainability perceptions as situationally modifiable variable can be strengthened in order to promote sustainable choices and behavior in the long term.

The dissertation thus has a number of objectives: First, it seeks to better understand the diverse aspects that constitute consumers' sustainability perceptions. Identifying these consumer-relevant aspects is decisive for determining the basis upon which consumers initially

form their sustainability perceptions. In this regard, this dissertation aims to advance the measurement of consumers' sustainability perceptions by developing a consumer-perceived brand sustainability scale. Second, the dissertation identifies the role of increased sustainability perceptions in the consumer context. It argues that consumers individual perceptions serve as a direct antecedent of their consumption choices and behavior. For this reason, their mediating role between sustainable attributes or communication and consumer responses on both the product and brand level is examined. Third, the dissertation investigates the effectiveness of different sustainability communication types in increasing consumers' sustainability perceptions. Specifically, it focuses on the effects of holistic, benefit-centered, and value-targeted communication of factual sustainability information. Last, the dissertation includes personal values and attitudes and examines how these affect information processing and behavior in the context of sustainability.

The main findings can be summarized as follows: The dissertation underscores the diversity of aspects that are relevant to consumers' sustainability perceptions. They include the environmental, social and economic aspects that are relevant for sustainability according to the Triple Bottom Line. However, numerous additional aspects relating to sustainability communication, such as credibility and transparency, play an important role as well. Additionally, the mediating role of sustainability perceptions in the consumption context is demonstrated. If they increase as a result of sustainable product or brand characteristics or effective sustainability communication, this has a positive effect on further variables relevant to purchasing and behavior (e.g., purchase intention or willingness-to-pay).

The findings also reveal that sustainable values and motivations act as drivers of sustainable behavior and the processing of sustainability-related information. They serve as lenses through which consumers see sustainable products and brands. They determine the attention that consumers give to specific sustainability information and its importance for the formation of sustainability perceptions.

This dissertation contributes to research by providing new insights into consumers sustainability perceptions both on product- and brand level. By generating knowledge on the conceptualization, drivers, and consequences of consumers' sustainability perceptions, this dissertation contributes to research on understanding and fostering sustainable consumer behavior. It provides valuable theoretical and methodological guidance for integrating the consumer perspective on sustainability in future research. Additionally, it offers assistance for practitioners seeking effective and credible forms of communication to strengthen the sustainability perceptions.

Zusammenfassung

Die individuellen Wahrnehmungen von KonsumentInnen haben einen erheblichen Einfluss auf ihre Kaufentscheidungen und Verhaltensweisen, so auch im Bereich des nachhaltigen Konsumverhaltens. Trotz umfangreicher Forschung zum nachhaltigen Konsumentenverhalten ist die Nachhaltigkeitswahrnehmung von VerbraucherInnen nach wie vor unzureichend erforscht. In der Regel definieren und manipulieren Forschende nachhaltige Eigenschaften von Produkten oder Marken und untersuchen dann deren direkten Einfluss auf die Reaktionen der Konsumierenden, ohne deren Nachhaltigkeitswahrnehmung einzubeziehen. Es bleibt daher weitgehend unklar, welche Aspekte die Nachhaltigkeitswahrnehmung von VerbraucherInnen ausmachen und welche Rolle sie im Konsumkontext spielen.

Diese Forschungslücke hat im Bereich des nachhaltigen Konsumverhaltens besonders schwerwiegende Folgen, da der Wahrnehmungsprozess nicht nur durch individuelle Eigenschaften des Konsumenten bzw. der Konsumentin (z.B. Werte, Einstellungen oder Motivationen), sondern auch maßgeblich durch die Eigenschaften des Themas Nachhaltigkeit selbst bestimmt wird. Für Konsumierende, die keine ExpertInnen auf diesem Gebiet sind, ist Nachhaltigkeit ein abstraktes und komplexes Thema, das nur schwer zu erfassen ist.

Zudem ist die Nachhaltigkeit bestimmter Verhaltensweisen, Produkte oder Marken in der Regel ein „credence attribute“ und kann nicht direkt beobachtet oder ermittelt werden. Daher weicht die Nachhaltigkeitswahrnehmung oft von der tatsächlichen, nach objektiven Kriterien gemessenen, Nachhaltigkeit ab. Die subjektive Nachhaltigkeitswahrnehmung der KonsumentInnen ist jedoch das, was letztlich ihre Konsumentscheidungen prägt. Um nachhaltiges Verbraucherverhalten besser zu verstehen, sollten daher die Nachhaltigkeitswahrnehmungen in die Forschung einbezogen werden.

Darüber hinaus ist die Wahrnehmung von Nachhaltigkeit in der unternehmerischen Praxis von großer Bedeutung. Wenn nachhaltige Produkte oder Marken ein hohes Maß an tatsächlicher Nachhaltigkeit aufweisen, aber von den Konsumierenden nicht als nachhaltig wahrgenommen werden, können sie ihr Potenzial nicht ausschöpfen. Umgekehrt riskieren Produkte oder Marken, die nicht wirklich nachhaltig sind, aber von den KonsumentInnen als solche wahrgenommen werden, ihren Ruf zu schädigen, wenn sie als "Greenwashers" entlarvt werden.

Die vorliegende Dissertation befasst sich mit dieser Lücke, indem sie die Vielschichtigkeit der Nachhaltigkeitswahrnehmung von Verbrauchern untersucht und sich dabei sowohl auf die Produkt- als auch auf die Markenebene konzentriert. Ihr zentrales Ziel ist es, das Wissen über die Konzeptualisierung der Nachhaltigkeitswahrnehmungen sowie deren

Einflussfaktoren und Konsequenzen zu erweitern. Der Fokus liegt dabei auf der Frage, wie die Nachhaltigkeitswahrnehmung als situativ modifizierbare Variable gestärkt werden kann, um nachhaltige Entscheidungen und Verhaltensweisen langfristig zu fördern.

Die Dissertation verfolgt daher eine Reihe von Zielen: Erstens sollen die verschiedenen Aspekte, welche die Nachhaltigkeitswahrnehmung der KonsumentInnen ausmachen, besser verstanden werden. Die Identifizierung dieser konsumentenrelevanten Aspekte ist entscheidend für die Bestimmung der Grundlage, auf der Konsumierende ihre Nachhaltigkeitswahrnehmung bilden. In dieser Hinsicht zielt diese Dissertation darauf ab, die Messmöglichkeiten durch die Entwicklung einer Skala für die wahrgenommene Markennachhaltigkeit zu verbessern. Zweitens wird in der Dissertation die Rolle einer erhöhten Nachhaltigkeitswahrnehmung im Konsumkontext identifiziert. Es wird dargelegt, dass die individuellen Wahrnehmungen von Konsumierenden eine direkte Vorstufe zu ihren Konsumentscheidungen und Verhalten darstellen. Daher wird ihre mediierende Rolle zwischen nachhaltigen Attributen oder Nachhaltigkeitskommunikation und Konsumentenreaktionen sowohl auf Produkt- als auch auf Markenebene untersucht. Drittens beschäftigt sich die Dissertation mit der Wirksamkeit verschiedener Formen der Nachhaltigkeitskommunikation, zur Erhöhung der Nachhaltigkeitswahrnehmung von Konsumierenden. Konkret geht es um die Wirkung von ganzheitlicher, nutzenzentrierter und wertbezogener Kommunikation von faktischen Nachhaltigkeitsinformationen. Schließlich bezieht die Dissertation persönliche Werte und Einstellungen mit ein und untersucht, wie diese die Informationsverarbeitung und das Verhalten im Kontext von Nachhaltigkeit beeinflussen.

Die wichtigsten Ergebnisse lassen sich folgendermaßen zusammenfassen: Die Dissertation unterstreicht die Vielfalt der Aspekte, die für die Nachhaltigkeitswahrnehmung der Konsumenten relevant sind. Dazu gehören die ökologischen, sozialen und ökonomischen Aspekte, die für die Nachhaltigkeit im Sinne der Triple Bottom Line relevant sind. Daneben spielen aber auch zahlreiche weitere Aspekte der Nachhaltigkeitskommunikation, wie Glaubwürdigkeit und Transparenz, eine wichtige Rolle. Zudem wird die mediierende Rolle der Nachhaltigkeitswahrnehmung im Konsumkontext aufgezeigt. Erhöht sich diese durch nachhaltige Produkt- oder Markeneigenschaften oder eine wirksame Nachhaltigkeitskommunikation, wirkt sich dies positiv auf weitere kauf- und verhaltensrelevante Variablen (z.B. Kaufabsicht oder Zahlungsbereitschaft) aus.

Die Ergebnisse zeigen auch, dass nachhaltige Werte und Motivationen als Antrieb für nachhaltiges Verhalten und die Verarbeitung von nachhaltigkeitsbezogenen Informationen dienen. Sie wirken wie eine Brille, durch die Verbraucher nachhaltige Produkte und Marken

sehen. Sie bestimmen die Aufmerksamkeit, die die Verbraucher bestimmten Informationen schenken, und deren Bedeutung für die Bildung von Nachhaltigkeitswahrnehmungen.

Diese Dissertation trägt zur Forschung bei, indem sie neue Einblicke in die Nachhaltigkeitswahrnehmung von Konsumenten sowohl auf Produkt- als auch auf Markenebene liefert. Durch die Gewinnung von Erkenntnissen über die Konzeptualisierung, die Einflussfaktoren und die Konsequenzen der Nachhaltigkeitswahrnehmung von Verbrauchern trägt sie zur Forschung zum Verständnis und zur Förderung von nachhaltigem Konsumverhalten bei. Sie liefert wertvolle theoretische und methodische Anhaltspunkte für die Integration der Verbraucherperspektive auf Nachhaltigkeit in die künftige Forschung. Darüber hinaus bietet sie eine Hilfestellung für Praktiker, die nach effektiven und glaubwürdigen Kommunikationsformen zur Stärkung der Nachhaltigkeitswahrnehmung suchen.

Content overview

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[1] Titles of the subchapters for the research papers vary based on the specifications of the journals in which the research papers are submitted.

List of figures

List of tables

List of abbreviations

Acc	Accessibility
AMOS	Analysis of moment structures
ANCOVA	Analysis of covariance
ANOVA	Analysis of variance
AOM	Annual Meeting of the Academy of Management
AVE	Average variance extracted
BSP	Brand sustainability perceptions
BST	Brand sustainability
CAt	COVID-19 attitude change toward SFSCs
CFA	Confirmatory factor analysis
CFI	Comparative fix index
CI	Confidence interval
CM	Cause-related marketing
COVID-19	Coronavirus disease 2019
PST	Perceived sustainability
CR	Composite reliability
CREP	Corporate reputation
CSA	Community-supported agriculture
CSR	Corporate social responsibility
df	Degrees of freedom
DPI	Domestic provenance importance
EFA	Exploratory factor analysis
e.g.	Exempli gratia
EACR	European Conference of the Association of Consumer Research
EAFRD	European Agricultural Fund for Rural Development
EC	European Commission
EC (Chapter 6)	Environmental concern
EI	Ethical identity
ELM	Elaboration-likelihood model
EMAC	European Marketing Academy Conference
ESB	Environmental sustainability benefits
EU	European Union
FL	Factor loading
FR	Fruit
FREX	Frequency and exclusivity
FSE	Factorial survey experiment
GBI	Green brand image
GCV	Green consumption values
H	Hypothesis
HC	Health consciousness
HTMT ratio	Heterotrait-monotrait ratio
ICORIA	International Conference on Research in Advertising
i.e.	Id est

IFI	Incremental fit index
ISCED	International Standard Classification of Education
KMO	Kaiser–Meyer–Olkin test
ML	Maximum likelihood
MS	Meat substitute
NFI	Normative fit index
NNFI	Non-normed fit index
OIM	One-item measure
OM	Oyster mushrooms
PA	Product attitude
PBA	Perceived brand authenticity
PCA	Principal component analysis
PBC	Perceived brand credibility
PGW	Perceived greenwashing
PI	Purchase intention
PSP	Product sustainability perceptions
RISM	Research Innovations in Sustainable Marketing
RMSEA	Root mean square error of approximation
RQ	Research question
SCR	Scale composite reliability
SD	Standard deviation
SE	Standard error
SEM	Structural equation modeling
SFSC	Short food supply chain
SPSS	Statistical Package for the Social Sciences
SRMR	Standardized root mean square residual
SSB	Social sustainability benefits
STM	Structural topic modeling
T (Chapter 2)	Topic
TBL	Triple Bottom Line
TLI	Tucker-Lewis index
UN	United Nations
US	United States
USA	United States of America
WOM	Word-of-mouth
WTP	Willingness-to-pay

List of symbols

α	Cronbachs alpha
B/b	Unstandardized coefficient
β/Beta	Standardized coefficient
F	F statistic
k	Number of topics
M	Mean
N	Population size
n	Sample size
p	Significance value
R^2	R squared, coefficient of determination
t	T statistic
Θ	Text–topic correspondence
χ^2	Chi square

1. Introduction

There is an objective reality out there,

but we always view it through the lens of our beliefs and values.

David G. Myers

While people may face identical situations and share the same objective reality, their behavior can vary substantially (Robbins & Judge, 2023; Thøgersen, 2023). For instance, one person might perceive a particular event or object negatively, leading to its avoidance, while another sees it as positive, eliciting an entirely opposite reaction. This is illustrated by David G. Myers' (2010) statement about people perceiving objective reality based on their beliefs, attitudes, and values. It underscores that our individual perceptions are like lenses through which we interpret our environment and interact with it. Therefore, perceptions are not only highly individual but also decisively influence how people behave (Mothersbaugh et al., 2020; Thøgersen, 2023).

In consumer behavior research, this makes it essential to examine consumers' *perceptions* of the phenomena of interest, as they influence subsequent consumer responses and decisions (Mothersbaugh et al., 2020; Sokolova et al., 2023). In various areas of consumer behavior research, this is routine, such as when considering individual perceptions of quality or risk and their impact on consumer responses (e.g., Campbell & Goodstein, 2001; Zeithaml, 1988). However, when investigating *sustainable* consumer behavior, consumers' sustainability perception is an aspect that has rarely been considered so far (Granato et al., 2022; Peloza et al., 2012; Sokolova et al., 2023; Steenis et al., 2023).

This is surprising as the area of sustainable consumer behavior is becoming increasingly relevant. Consumers nowadays live in a world in which sustainability is relevant in many different realms of their lives (Rathee & Milfeld, 2023; White et al., 2019). They therefore find themselves in an objective reality in which sustainability is of great importance. To better understand consumer behavior in this context, it would be beneficial to incorporate sustainability perceptions into research approaches.

However, researchers typically predefine and present different types of behaviors, products, or brands as sustainable by manipulating a specific, single sustainable characteristic (e.g., a product consisting of sustainable materials, or a brand engaging in a social cause; Catlin et al., 2017). When defining these manipulations, researchers typically choose aspects that experts consider to be sustainable in a top-down manner (Shultz et al., 2022).

Among experts, sustainability is usually defined as in the Brundtland report (1987) by meeting "the needs of the present without compromising the ability of future generations to meet their own needs" (p. 8) and includes three pillars according to the Triple Bottom Line (TBL) approach (social, environmental, and economic; Elkington, 1997). However, when consumers as laypersons (in terms of lacking specialized expert knowledge about sustainability) interpret complex, abstract, and difficult-to-verify sustainability stimuli, a variety of other associations can play a role (White et al., 2019).

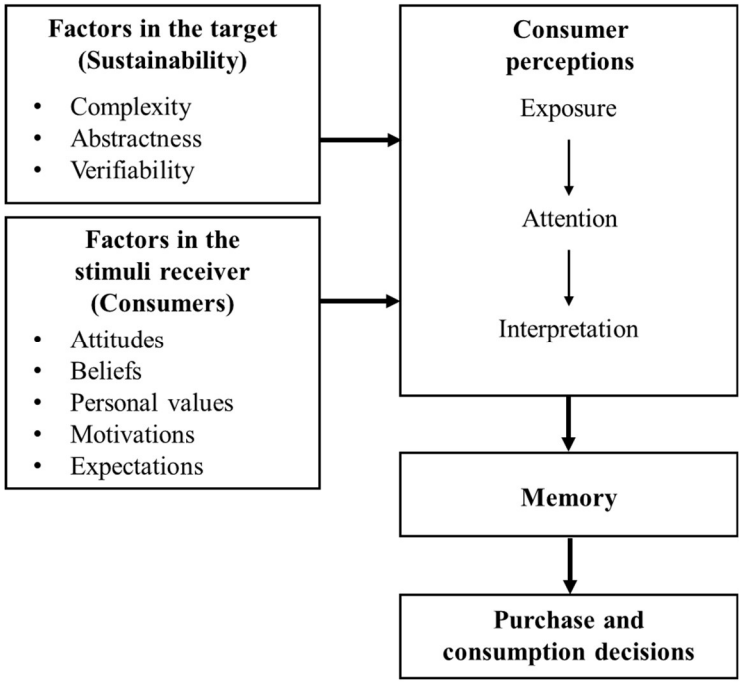
For example, prior research highlights that consumers often do not perceive the three pillars of sustainability to be equally relevant (Eisingerich et al., 2023; Simpson & Radford, 2012) and integrate aspects that go beyond the three pillars into their understanding of sustainability (Barone et al., 2020; Hanss & Böhm, 2010). Moreover, communicational aspects such as credibility and transparency play an important role for consumers (Dando & Swift, 2003; Delmas & Grant, 2014). Research has thus shown that there are major discrepancies between objective sustainability and consumer perception at both product and brand level (Herbes et al., 2020; Peloza et al., 2012; Sokolova et al., 2023; Steenis et al., 2023).

This highlights that a mere top-down application of the TBL definition (expert view) to capture consumer responses to sustainable options falls short (Shultz et al., 2022). Incorporating consumers' sustainability perceptions from the bottom-up in research approaches is therefore a key factor for the further development of research on sustainable consumer behavior.

1.1 Theoretical and practical relevance of consumers' sustainability perceptions

To better understand which sustainable behaviors, products, or brands will likely be adopted by consumers, the perceptual level needs to be considered. Promoting genuinely sustainable behaviors and choices is only possible if the reality in which consumers live and make decisions is properly comprehended by academic scholars as well as practitioners. Figure 1-1 illustrates the critical importance of considering consumer perceptions, especially in the context of sustainable consumer behavior.

In general, the perceptual process starts with consumers (as stimuli receivers) being exposed to certain stimuli that attract their attention and are then interpreted (Mothersbaugh et al., 2020). The generated perceptions then enter the consumers' memory, which is the basis for subsequent purchasing and consumption decisions.



Source: Own figure, adapted from Mothersbaugh et al., 2020 and Robbins & Judge, 2023.

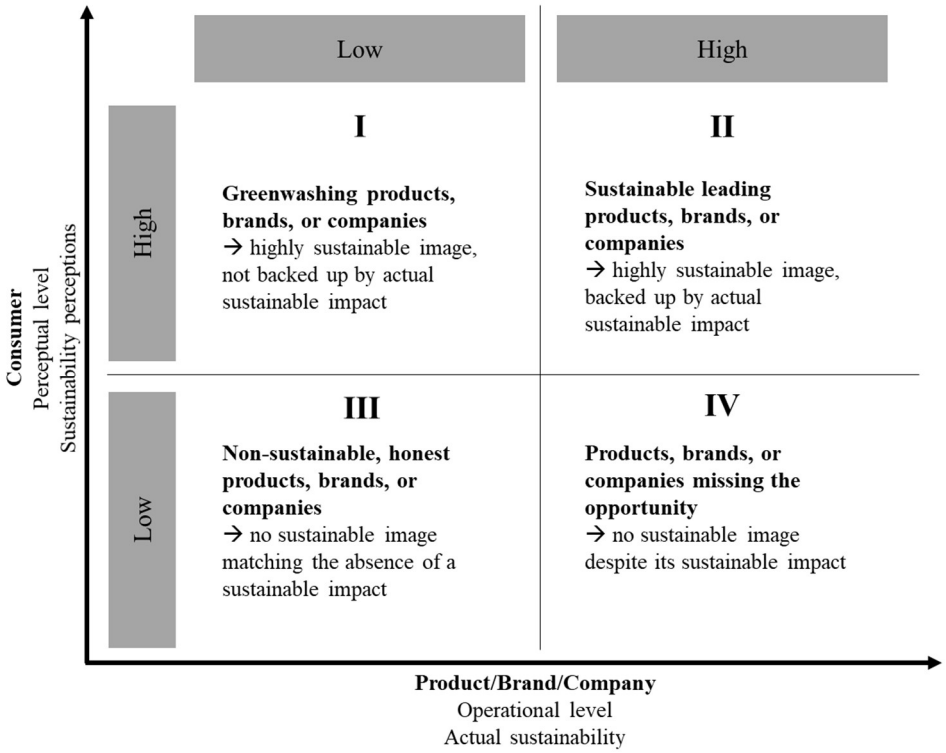
Figure 1-1. Consumer perceptions in the purchasing and consumption process.

It is therefore common that the characteristics of the stimuli receiver influence the perceptual process (Robbins & Judge, 2023). These include the beliefs and values mentioned by Myers (2010). Likewise, attitudes, personal motivation, and expectations play a role (Mothersbaugh et al., 2020; Thøgersen, 2023). What is particularly unique in sustainable consumer behavior, however, is the very specific nature of the target itself (i.e., sustainability) that impacts the perceptual process (Thøgersen, 2023; White et al., 2019).

The concept of sustainability is marked by its complexity and abstractness (Phipps et al., 2013; White et al., 2019). Issues and solutions related to sustainability often appear vague and difficult to imagine for consumers without integrated knowledge (Gleim et al., 2013; Reczek et al., 2018; Winterich et al., 2023). The topic is focused on global (instead of local, tangible) and future-oriented actions, making it feel more distant to consumers (Reczek et al., 2018; White et al., 2019). Additionally, the outcomes of sustainability initiatives and sustainable (product/brand) attributes are often not directly observable to consumers (Atkinson & Rosenthal, 2014; Connelly, Ketchen, & Slater, 2011). To evaluate the complex topic of sustainability, consumers therefore need to rely on information that different actors in the marketplace communicate (Connelly, Ketchen, & Slater, 2011; Meise et al., 2014). This makes the reality in which consumers find themselves a high-noise information environment (Janssen et al., 2022; Steigenberger & Wilhelm, 2018).

Consumers may have difficulties navigating this complex environment (Steigenberger & Wilhelm, 2018). As a result, their subjective perception of sustainability often diverges from objective sustainability (Sokolova et al., 2023). Such deviations have repeatedly been empirically demonstrated in research (e.g., Herbes et al., 2020; Peloza et al., 2012; Sokolova et al., 2023). This illustrates the relevance of sustainability perceptions for research, as a definition of sustainability based solely on objective criteria falls short when it comes to explaining sustainable consumer behavior (Shultz et al., 2022; Steenis et al., 2023).

Likewise, sustainability perceptions are highly relevant for business practice. To effectively design and communicate sustainability attributes and initiatives, the actual sustainability of products or brands and their perceived sustainability should be considered jointly (Crittenden et al., 2011; Kapitan et al., 2019; Peloza et al., 2012). This does not imply replacing objective sustainability criteria by relying on consumers' lay perceptions, but rather that companies can enhance their sustainability approach by integrating consumer perceptions at the communicational level alongside objective criteria at the operational level. This is exemplified by the interplay of actual and perceived sustainability. The combination of both dimensions results in four categories, contingent on the alignment or mismatch between the actual and perceived levels of sustainability (Kapitan et al., 2019; Peloza et al., 2012).



Source: Own figure, adapted from Kapitan et al. (2019) and Peloza et al (2012).

Figure 1-2. Interaction of actual and perceived sustainability.

Companies and their products can be either simultaneously low or high on both dimensions (and thus either unsustainable or sustainable; see quadrants II and III). However, a mismatch between both dimensions holds negative consequences both for the company and for driving sustainable consumption (Kapitan et al., 2019). If a company is actually sustainable but this is not recognized by consumers, the company will not profit from its sustainability efforts (see quadrant IV). This threatens the long-term sustenance of its sustainability strategy (Carter et al., 2021). Conversely, if perceived sustainability is high, but the company is not actually sustainable (see quadrant I), there is a risk of creating greenwashing perceptions in the long term (Chen & Chang, 2013). Therefore, aligning both dimensions is important as trust and credibility are major success factors for effective sustainability strategies.

In summary, sustainability perceptions represent an important construct for understanding and promoting sustainable consumption choices. Thus, the dissertation builds on this and generates theoretical and empirical insights into its conceptualization, drivers, and consequences.

1.2 Research gaps and questions

Extant research provides valuable insights into the factors influencing consumer responses to sustainable products and brands in various contexts. However, fragmented results emerge, notably regarding the (positive or negative) impact of sustainable products and brands on consumer responses (e.g., Chernev & Blair, 2021; Luchs et al., 2010). Additionally, an attitude-behavior gap is evident, showing that even though consumers value sustainability, this does not consistently translate into more sustainable consumer behavior or choices (Park & Lin, 2020). The reasons for these somewhat fragmented findings are diverse, partly stemming from the predominant incorporation of the top-down definition of sustainability, insufficiently considering consumers' sustainability perceptions (Shultz et al., 2022). Addressing this research gap, the dissertation focuses on an integrated, multidimensional approach to understanding consumers' sustainability perceptions.

Its central aim is to investigate consumer perceptions of sustainability at various levels (product- and brand-related). Due to the limited existing research, the primary focus lies on exploring factors that influence sustainability perceptions to develop a nuanced conceptualization from the consumers' perspective. This includes examining the role of sustainability perceptions in the consumption context. The dissertation therefore investigates the consequences of the construct and identifies its mediating role.

In the first step, the dissertation seeks to comprehensively grasp the aspects that constitute consumers' sustainability perceptions. As previous sustainability research often adopted a top-down definitional approach, there is uncertainty about which aspects are relevant from the consumer perspective. Therefore, this dissertation explores the aspects that shape sustainability perceptions and is concerned with how these can be integrated into further research (e.g., in the form of a comprehensive, nuanced measurement instrument).

Moreover, prior research has predominantly concentrated on examining the impacts of sustainable product or brand alternatives on general consumption-related dependent variables, such as purchase intention or attitude toward the product or brand. Derived from the theoretical model of the perception process (Mothersbaugh et al., 2020; Robbins & Judge, 2023), however, sustainability perceptions take on a mediating role in this process, translating actual sustainability attributes into consumer responses. Particularly because sustainable attributes have appeared both as an asset and a liability in previous research (e.g., Chernev & Blair, 2021; Luchs et al., 2010), the role of sustainability perceptions in this context is noteworthy. The dissertation addresses these aspects and is guided by the first research question (RQ):

RQ1 *Which aspects shape consumers' sustainability perceptions and how do they affect subsequent consumer responses?*

Consumers' product or brand sustainability perceptions are situationally modifiable elements. They can be affected by marketers and other stakeholders to promote sustainable consumption choices, for example through sustainability education or communications (Fischer et al., 2021). However, implementing effective and credible sustainability communication is often difficult in reality (Leonidou & Skarmeas, 2017; Viciunaite, 2022).

Product and brand sustainability are credence goods that cannot be verified directly by consumers (Delmas & Grant, 2014). The stimuli that are acquired within the process of forming sustainability perceptions are therefore mainly information provided by companies and other stakeholders (Atkinson & Rosenthal, 2014). Often, this information is complicated or unintelligible to consumers, leading to confusion, mistrust, and perceptions of greenwashing (Chen & Chang, 2013). To meet these challenges and ensure that sustainable products or brands are clearly recognizable to consumers, insights into effective sustainability communication are valuable (Fischer et al., 2021).

Despite its importance, no mature field of sustainability communication research has yet emerged (Fischer et al., 2021). Existing studies have investigated various facets of sustainable advertising and marketing, including labels as a form of information reduction

(Atkinson & Rosenthal, 2014), the incorporation of values or norms in promotional statements (Kavvouris et al., 2020), or the effect of visual cues such as colors or images of nature (Hartmann & Apaolaza Ibáñez, 2009; Pancer et al., 2017). However, most of these studies focus on advertising techniques and visual communication elements rather than on the communication of factual verbal sustainability information (i.e., textual descriptive statements or claims) to strengthen consumers' sustainability perceptions (Rathee & Milfeld, 2023; Steenis et al., 2023). As many of the researched elements are conceptually closely linked to greenwashing perceptions (e.g., images of nature without accompanying information or vague sustainability claims), the communication of factual sustainability information is increasingly relevant (Ganz & Grimes, 2018; Parguel et al., 2015). This dissertation addresses this aspect by examining the impact of different forms of sustainability communication on consumers' sustainability perceptions. In this regard, the research is guided by the following question:

RQ2 *How can sustainability information be effectively communicated to increase consumers' sustainability perceptions?*

Finally, this dissertation integrates aspects from attitudinal research. The field of sustainable consumer behavior is characterized by certain consumer groups reacting differently to sustainable products, brands, and information (e.g., Barbarossa & De Pelsmacker, 2016). Among others, attitudes toward the environment, society, and sustainability as well as personal values and motivations influence how consumers react to sustainability (information) (Thøgersen, 2023). Typically, biospherically and altruistically minded, or so-called sustainable consumers react more positively to sustainable options and have a higher intrinsic motivation to process sustainability information (Groot & Steg, 2008; Leonidou & Skarmeas, 2017).

At the same time, it has been shown that personal attitudes and values can entail selection biases in information processing (Schuhwerk & Lefkoff-Hagius, 1995) or trigger motivated reasoning processes in which information is interpreted in a way that supports one's own belief system (Haws et al., 2014; Verplanken & Holland, 2002). Thus, in studies dealing with sustainability perceptions, it is imperative to incorporate the influence of personal attitudes and values. The dissertation therefore includes the following research question:

RQ3 *How do personal attitudes, values, and motivations influence consumer responses to sustainability communication and sustainable consumer behavior?*

1.3 Structure and key contributions of this dissertation

Research on sustainable consumer behavior is multifaceted and marked by the interconnection of different literature streams. The papers included in this dissertation aim to address the complexity of sustainability perceptions and provide a nuanced understanding of the construct.

The dissertation takes a multidisciplinary stance and incorporates elements and methodologies from sustainability marketing, management, and communication literature.

Additionally, the employed methodological diversity is a strength of the dissertation. As previous studies have placed limited focus on examining the construct as well as its drivers and consequences, this dissertation combines both exploratory and explanatory methods to investigate sustainability perceptions, their drivers, and consequences.

Non-standardized methods (i.e., qualitative in-depth interviews and open questions in surveys) are used to exploratively capture consumers' views in an open manner. These projective approaches make it possible to uncover underlying aspects of consumers' sustainability perceptions that are difficult to grasp (Li & Ma, 2020; Vidal et al., 2013). In this regard, the use of automated text analysis (in the form of structural topic modeling) for the semi-automated analysis of consumer responses to open survey questions is particularly noteworthy (Roberts et al., 2014). It enables the analysis of larger amounts of textual consumer data and thus detailed insights into the aspects that underlie the responses of a larger, more generalizable sample (Berger et al., 2020).

These explorative insights are further developed to examine sustainability perceptions in quantitative studies. In this regard, also a variety of methods is used: Survey data is analyzed using structural equation models to map causal processes (Anderson & Gerbing, 1988), especially on the role of personal attitudes, values, and motivations. Various drivers of sustainability perceptions are tested experimentally. In this regard, not only traditional between-subjects experimental designs but also a factorial survey experiment (FSE) is implemented to test the influence of various influencing factors on sustainability perceptions in an integrative way (Auspurg & Hinz, 2015).

This multifaceted approach allows for triangulation of findings across different methodologies, enhancing the validity and reliability of the conclusions drawn. Moreover, by integrating both quantitative and qualitative methods, the dissertation ensures a nuanced exploration of the complexities inherent in consumers' sustainability perceptions.

In sum, the strength of this dissertation lies in its methodological diversity, the examination of diverse product categories, the inclusion of consumer samples from different

countries, and the integration of multiple literature streams. To provide a concise overview, Figure 1-3 locates the individual research papers of this dissertation in the involved levels and research areas.

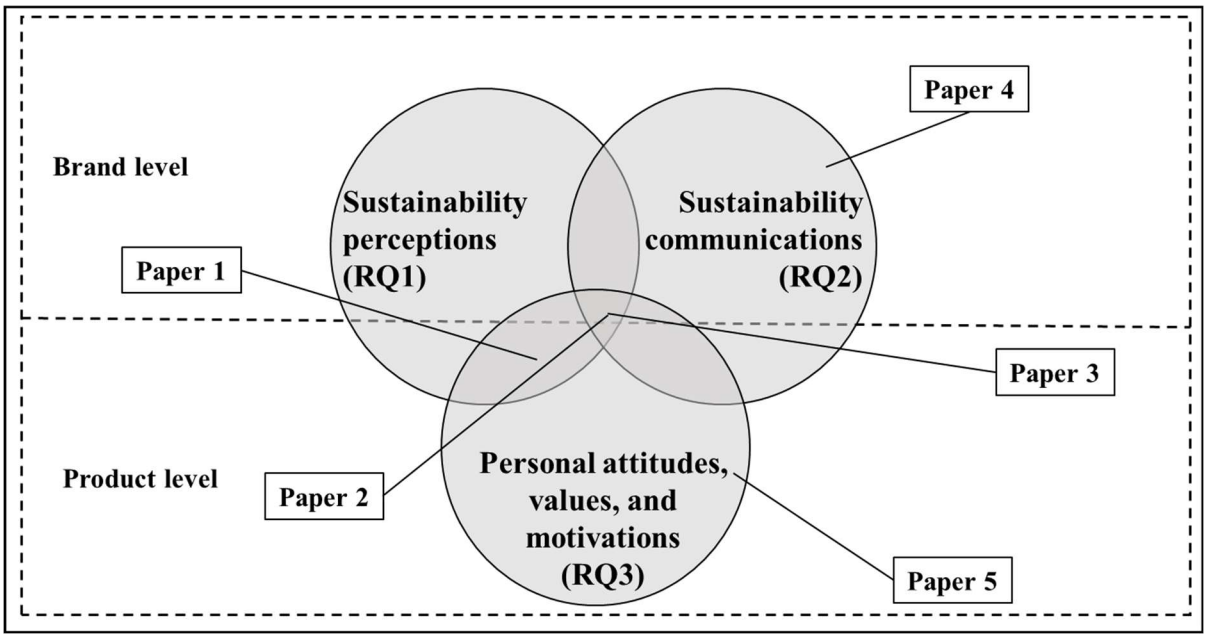


Figure 1-3. Conceptual overview of the research questions and papers.

The dissertation is structured into seven chapters, encompassing five research papers. The first and last chapters form common framework, while chapters two to six introduce the research papers. Table 1-1 provides an overview of the papers, including their focus, methodology, key findings, and current status.

Table 1-1. Overview of research papers in this dissertation.

Research paper	Focus	Data	Key findings	Current status[a]
Consumer-perceived brand sustainability: Conceptualization, scale development, and validation	Explorative investigation of factors underlying consumer-perceived brand sustainability (PST) as foundation of a scale development process including several validation steps, mediating role of PST	2 Pretests 5 Survey studies 1 Qualitative study (interviews) 1 Experimental study (N = 7,488)	PST includes numerous operational and communicative aspects and acts as a situationally influenceable variable, which is a precursor to purchase-relevant variables.	Under review
Experimental insights into the impact of holistic sustainability signaling on consumers	Effects of holistic sustainability information on consumers' product sustainability perception and the indirect effect on purchase-relevant variables	1 Factorial survey experiment (FSE) 2 Experimental studies (N = 851)	Holistic sustainability information covering different sustainability dimensions and product lifecycle phases most positively influences consumers' product sustainability perceptions and subsequent purchase-relevant variables.	Under review
The influence of green consumption values on how consumers form overall sustainability perceptions of food products and brands	Effects of green consumption values on product and brand sustainability perceptions, mediating role of the perceived product sustainability benefits	1 Survey study (N = 1,577)	Consumers with higher green consumption values perceive environmental and social sustainability product benefits to a greater extent. Increased perceptions of environmental sustainability benefits, in turn, enhance overall product sustainability perceptions.	Published in *Journal of Sustainable Marketing*
Facts over stories: How sustainability storytelling can backfire	Effects of the communication style storytelling on consumer responses in the context of greenwashing and perceived information amount in sustainability information.	1 Pretest 1 Experimental study (N = 677)	Narrative ads without factual sustainability information (compared to factual or hybrid ads) negatively influence consumer responses due to increased greenwashing perceptions and a lower perceived amount of information.	Submitted to *Annual Conference of the European Marketing Academy (EMAC)*
When mindful consumption meets short food supply chains: Empirical evidence on how higher-level motivations influence	Effects of three higher-level motivations (i.e., health consciousness, ethical identity, and environmental consciousness) related to mindful consumption on behavior toward short food supply chains (SFSCs)	1 Survey study (N = 1,299)	While environmental consciousness has a strong effect on current purchase behavior at SFSCs, ethical identity influences intended future purchase behavior.	Published in *Sustainable Production and Consumption*

[a] Status at the time of submission of the dissertation.

The first paper (*"Consumer-perceived brand sustainability: Conceptualization, scale development, and validation"*) aims to conceptualize and measure sustainability perceptions on the brand level. Due to a lack of insight into the dimensions underlying the construct of "consumer-perceived brand sustainability" (PST) to date, an exploratory approach was adopted. To record consumer-relevant aspects of brand sustainability, projective techniques and automated text analysis were employed in Study 1a (Berger et al., 2020; Li & Ma, 2020). The automated analysis of open-ended survey questions enabled the free articulation of consumers and the semi-automated identification of aspects in the large sample of consumer responses. The identified aspects were validated by qualitative in-depth interviews (Study 1b). The results provided a solid empirical basis for a traditional scale development process, that validated the scale in different languages and contexts across five studies (Studies 2a to 5). Additionally, the mediating role of PST as a preceding factor for purchase-relevant variables was shown in a nomological framework. In this regard, this paper addressed RQ1 and RQ3.

This paper contributes to research by offering insights into how consumers conceptualize brand sustainability. Additionally, it generates knowledge on PST's role in driving consumer responses. To promote further consumer-centric research in the realm of sustainable brands, it provides a measurement tool that captures the nuances of PST. It tackles a managerially relevant variable to help practitioners incorporate the consumer perspective more comprehensively into their sustainable brand development.

The second research paper included in the dissertation (*"Experimental insights into the impact of holistic sustainability signaling on consumers")* addressed sustainability perceptions at the product level. In the light of signaling theory, it aims to understand how sustainability signaling affects consumers' sustainability perceptions and further purchase-relevant variables. Prior research investigated the impact of different isolated sustainability signals on sustainable products (Rathee & Milfeld, 2023). However, companies typically do not send single signals but rather use so-called signal portfolios (i.e., sets of signals; Zerbini, 2017). Such signal portfolios can contain several similar signals on one specific sustainability attribute or signals that complement each other so that the portfolio covers several sustainability dimensions as well as several product life cycle phases (Kapitan et al., 2019; Petersen & Brockhaus, 2017). While research shows that holistic approaches to sustainability have the greatest positive sustainability impact (Nikolaou & Tsalis, 2018), it remains unclear whether consumers value signal portfolios that reflect such approaches.

To address this, a factorial survey experiment was conducted. FSEs are particularly suitable for investigating complex, multidimensional human perceptions, such as consumers'

sustainability perceptions (Oll, Hahn, Reimsbach, & Kotzian, 2018). To verify and validate the results of the FSE with more realistic stimuli and in a different cultural context, two between-subject experiments in Germany and the US were conducted. Additionally, the effects of increased product sustainability perceptions on purchase-relevant variables were investigated. Therefore, this paper addresses all three RQs.

This paper contributes to research by conceptualizing holistic sustainability signaling and revealing that a holistic signaling approach positively influences consumers' sustainability perceptions which in turn improve purchase-relevant constructs. Additionally, it shows that consumers' sustainability perceptions are a key variable on the product-level as well. The paper uncovers the potential of holistic sustainability signaling to practitioners.

The objective of the third research paper (*"The influence of green consumption values on how consumers form overall sustainability perceptions of food products and brands"*) was to investigate how (green) consumers recognize sustainable (food) products as such. Drawing on means-end chain theory (Huber et al., 2004) and the elaboration likelihood model (ELM; Petty & Cacioppo, 1986), the paper aims to understand how green consumers form abstract overall product sustainability perceptions. It examines how consumers perceive concrete environmental and social product benefits (i.e., specific environmental and social factors of a product that contribute to the environment and society), due to information processing and how this affects more abstract sustainability perceptions. Green consumers are assumed to have a higher ability and motivation to process sustainability-related information, which has a positive influence on the perception of the sustainability benefits of products. To provide empirical evidence for this mechanism, survey data was analyzed using structural equation modeling. The paper thereby addresses RQ2 and RQ3.

By combining the means-end chain and ELM perspective, this paper provides valuable insights into the impact of green consumption values for sustainability information processing and the role of concrete sustainability benefits. It provides correlational insights into an effective way of communicating sustainability information through the emphasis on concrete sustainability benefits. The findings also offer practical contributions and underscore the importance of emphasizing sustainability benefits in sustainable marketing.

The fourth research paper (*"Facts over stories: How sustainability storytelling can backfire"*) aims to examine the effectiveness of storytelling as a communication format in the realm of sustainability communication. It specifically examines the role of factual information in this context. Storytelling has recently been mentioned several times as promising for effective sustainability communication (e.g., Dessart & Standaert, 2023). While storytelling has been

proven to be effective in a general marketing context, it incorporates elements (e.g., vague claims) that are theoretically associated with greenwashing in the sustainability context (Ganz & Grimes, 2018; Parguel et al., 2015). In addition, for sustainability communication, consumer skepticism and a greater desire for information prevail, which counteracts the communication format of a story (Leonidou & Skarmeas, 2017). Therefore, a between-subjects experiment was conducted to examine the impact of narrative sustainability ads compared to factual or hybrid ads to investigate their communicational effectiveness, addressing RQ2.

The paper contributes to the emerging research on storytelling in the sustainability context. It theoretically derives pitfalls of this technique in communicating sustainability information and provides empirical evidence to the discourse on narratives in sustainability marketing. In doing so, it also underscores the need for a careful integration of emotional storytelling and factual information for practitioners.

Finally, the fifth research paper (*"When mindful consumption meets short food supply chains: Empirical evidence on how higher-level motivations influence consumers"*) focused on the impact of personal values and motivations on sustainable consumer behavior. In light of the theoretical framework of mindful consumption, its objective was to understand the influences of three different higher-level motivations (i.e., health consciousness, ethical identity, and environmental consciousness; Sheth et al., 2011) on consumer behavior toward short food supply chains (SFSCs). SFSCs offer manifold sustainability benefits, for example, they offer local food causing less transportation emissions (Vittersø et al., 2019), increase the adoption of sustainable agricultural practices (Mundler & Laughrea, 2016), create jobs in rural areas (Jarzębowski et al., 2020), and improve job satisfaction of farmers (Mundler & Jean-Gagnon, 2020). Purchasing from SFSCs therefore represents a form of sustainable consumer behavior. Using structural equation modeling to analyze survey data, it examined the influence of the three different personal motivations to engage in this form of sustainable behavior and addressed RQ3.

The paper contributes to the literature on SFSCs and sustainable consumer behavior by documenting the diverse influences of different higher-level motivations with an integrative approach. It benefits from the differentiation between current and intended future behavior. The findings also provide insights for practitioners who seek to stimulate transformative action in food value chains.

In the last chapter, the key findings from the research papers and the overall contribution of this dissertation are discussed. Additionally, practical limitations as well as limitations of this work and avenues for future research are presented.

2. Conceptualizing and measuring brand sustainability through the consumers' lens

Abstract

While brand sustainability is becoming an increasingly important factor in the marketplace, the literature on how consumers perceive the sustainability efforts of brands is limited. However, consumers' individual perceptions typically drive their behavior toward brands. Therefore, insights into the conceptualization and role of consumers' perceptions of brand sustainability are essential for advancing marketing research and managerial practice. Across seven studies (N_{Total} = 7,330), this research employed a mixed-methods approach to develop a consumer-perceived brand sustainability (PST) scale. Automated text analysis of open-ended survey questions and in-depth interviews indicated relevant aspects for the conceptualization of PST. Building on this, the authors developed and validated a reliable scale to assess PST across different industries. Importantly, this research demonstrates the mediating role of PST in assessing the impact of brand sustainability on attitudinal and behavioral outcomes. The work contributes to research on a contemporary marketing phenomenon by providing knowledge on the nuances of PST and an applicable measurement tool for research as well as practice to capture PST.

Keywords: consumer-perceived brand sustainability, brand sustainability perceptions, brand sustainability measurement, consumer-centric approach

Authors: Melina Burkert and Verena Hüttl-Maack

Current status of the paper: This paper is currently under review. A former version of the paper has been presented at the *European Conference of the Association of Consumer Research (EACR)* 2022 in Amsterdam. The formatting of this paper has been adjusted to fit the formatting of this dissertation.

2.1 Introduction

The well-known phrase "perception is reality" is used to express the common-sense understanding that individuals act based on their unique interpretation and understanding of the world around them. For consumer behavior, perception matters because it is the basis for subsequent purchase and consumption decisions (Mothersbaugh et al., 2020); in the realm of sustainable brands, these relationships are of particular importance. Consumers' perceived sustainability (PST) of brands refers to a consumers' subjective interpretation of a brand's commitment to environmental and social sustainability and encompasses how consumers view a brand's sustainability efforts. This includes consumers' perceptions of a brand's endeavors and initiatives to make its products and practices more sustainable regarding environmental and/or social aspects aiming to contribute to social wellbeing and a healthy environment for future generations (Brundtland, 1987; Peloza et al., 2012).

In prior research, it has been shown that we cannot simply assume that consumers form an entirely objective evaluation of a brand's sustainability (Peloza et al., 2012). After all, most of them are laypersons (in the sense of not having specialized expertise in the area of sustainability or its evaluation), and their assessment of this complex and abstract topic is likely to deviate considerably from objective reality (Gershoff & Frels, 2015; Peloza et al., 2012; Sokolova et al., 2023; Winterich et al., 2023).

Understanding PST is therefore a contemporary marketing objective, as it helps in recognizing the "reality" in which consumers make their purchase and consumption decisions. We thus argue that consumers' perceptions of brand sustainability should be treated as a central construct in research on sustainable consumer behavior and branding (Kapitan et al., 2019; Sánchez-Chaparro et al., 2022).

In practice, the brand sustainability perception of consumers is already being increasingly considered when communicating sustainability efforts, and prominent brand sustainability rankings comprehensively integrate consumers' sustainability perceptions (e.g., Brand Finance, 2023; Sustainable Brand Index, 2023). However, in research, PST of brands has been neglected as an important variable when studying consumer responses to sustainable brands.

Typically, specific influencing factors, such as environmentally-friendly or socially fair attributes, are pre-defined, and subsequent consumer responses are then assessed (e.g., Carter et al., 2021; Gershoff & Frels, 2015). We argue that brand PST is a central mediating force that drives consumers' responses toward sustainable offerings and brands and should be carefully

considered in research. In particular, this is important due to the potential divergence of PST and objectively sustainable brands (Peloza et al., 2012).

Additionally, when brand sustainability has been investigated in consumer studies thus far, researchers typically adhered to an "objective" definition of sustainability that encompasses the environmental, social, and economic pillar of sustainability (Elkington, 1997). While these dimensions are indeed important for consumers when evaluating sustainability, prior research also indicates that aspects beyond those dimensions, such as perceived credibility and transparency of sustainability commitment, are also highly relevant (Crittenden et al., 2011; Luchs & Miller, 2015). This makes a consumer-centered research approach that considers these aspects worthwhile.

Recently, there have been calls to consider both actual and consumer-perceived sustainability (Kapitan et al., 2019; Sokolova et al., 2023) as well as to integrate consumers' bottom-up understanding of sustainability (Shultz et al., 2022) to more thoroughly understand sustainable consumer behavior. However, to date it is only conditionally feasible to incorporate PST as a mediator in consumer studies because research on what constitutes consumer perceptions of sustainable brands in the first place is scarce, and there is no measure that captures PST in a nuanced way. Until now, researchers aiming to assess the perceived sustainability of a brand only had the options of asking consumers directly whether a brand is perceived as environmentally sustainable and socially fair (Carter et al., 2021) or relying on sub-dimensions of existing scales on brand equity or reputation (Baalbaki & Guzmán, 2016; Walsh & Beatty, 2007).

This study addresses these calls and gaps with the following research goals:

1. *Identify aspects that are relevant for the conceptualization of brand sustainability from the consumers' perspective, and*
2. *Develop a measurement scale to capture PST.*

In pursuit of these goals, we executed a research process, commencing with an automated text analysis of qualitative consumer responses that informed the subsequent stages of scale development, as illustrated in Figure 2-1.

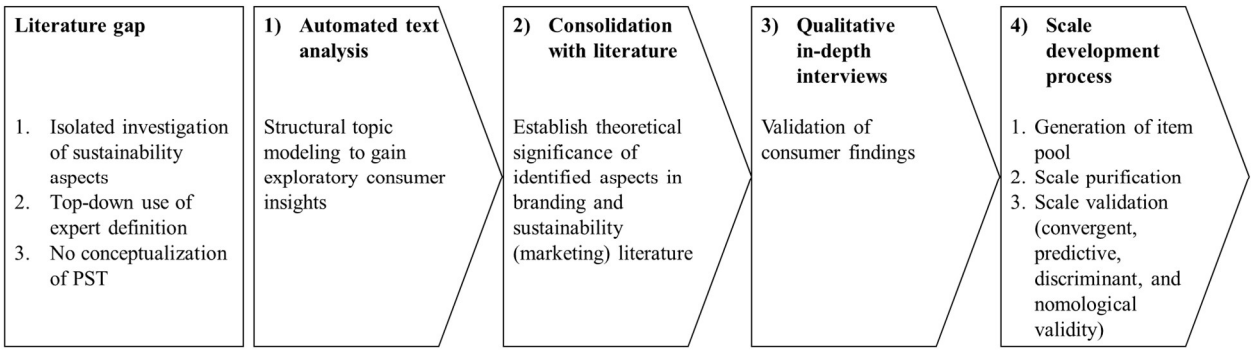


Figure 2-1. Methodology for developing the PST scale.

Due to the existing research gap on how consumer's sustainability perceptions should be conceptualized (Sokolova et al., 2023), it was of central importance to generate explorative insights into consumers' perspectives on brand sustainability as a first step. To do so, we complemented established scale development procedures with an innovative technique of automated text analysis to develop a valid and reliable measurement of consumers' brand sustainability perception. This process involved conceptualizing brand PST by using structural topic modeling (STM) to analyze open-ended survey questions and identify aspects underlying the consumer perception of sustainable brands (Heiberger & Munoz-Najar Galvez, 2021; Roberts et al., 2014). This approach allowed us to generate detailed consumer insights and still analyze larger amounts of textual data (Berger et al., 2020). The relatively large consumer sample generates more generalizable results (compared to a purely qualitative approach) as a solid basis for a PST scale. After identifying consumer-relevant aspects by using STM, the next step (i.e., step 2 in Figure 2-1) involved consolidating the findings with the branding and sustainability (marketing) literature to establish their theoretical significance. The findings were then (i.e., step 3 in Figure 2-1) validated through in-depth interviews. These steps laid the foundation for (i.e., step 4 in Figure 2-1) building a reliable item pool, which was then followed by a traditional scale development process, including scale generation, purification, and validation (Churchill, 1979; DeVellis, 2017; Netemeyer et al., 2003).

This study addresses a contemporary yet under-researched topic, and the contributions are relevant for both the academic and managerial world. In summary, this work accomplishes a number of objectives. First, we provide a conceptualization of the construct of brand PST and offer comprehensive empirical insights into how consumers form their impressions about sustainable brands. By providing exploratory insights into the construct, we respond to recent calls to encounter consumers' sustainability perceptions (Sokolova et al., 2023; Winterich et al., 2023).

Second, we provide a measurement scale that is relevant for researchers and practitioners alike. For researchers, our work can foster a systematic research approach into PST by providing an operationalization of a key variable for consumer studies. We provide insights into its important mediating role in sustainable consumption and shed light on the effects on consumers' attitudinal and behavioral responses that follow increased brand sustainability perceptions. The scale allows for more sophisticated analyses in the field of sustainability research, as it captures the nuances of brand sustainability and can be applied across different product areas. It refers to a managerially relevant construct for promoting sustainable consumer behavior that ca be situationally influenced by the actions of marketers.

For practitioners, our work offers avenues for integrating consumers' sustainability perceptions into their considerations, with the aim of improving the success of sustainability initiatives in the consumer market. Practitioners can assess the extent to which their sustainability efforts are perceived as such and predict whether they will be appreciated by consumers. In sum, we address the challenges and uncertainties around brand sustainability, and help to better assess consumers' perceived sustainability of brands, which, in turn, assists marketers and brand managers to include the perceptional dimension into the development of (more) sustainable brands.

2.2 Theoretical interaction of actual and perceived brand sustainability

For consumers, it has become increasingly important that brands implement sustainability efforts and, in particular, minimize negative impacts on the environment and society. Previous research shows that brands can benefit from implementing environmental or social sustainability actions, for example, through better evaluation of the brand (Sander et al., 2021), improved brand equity (Hur et al., 2014), higher consumer-brand identification (Lichtenstein et al., 2004; Öberseder et al., 2014), and increased purchase intentions (Carter et al., 2021; Öberseder et al., 2014). However, these positive results can only be generated if consumers perceive the actual sustainability of brands (Kapitan et al., 2019; Sánchez-Chaparro et al., 2022).

In this regard, the definition that typically guides brands' sustainability efforts is relatively straightforward. Among experts, sustainability is usually top-down defined as in the Brundtland report (1987) by meeting "the needs of the present without compromising the ability of future generations to meet their own needs" (p. 8) and comprises three pillars (social, environmental, and economic). This objective conceptualization aligns well with the

managerial view of the Triple Bottom Line, which mostly guides the sustainability efforts of brands (Crittenden et al., 2011; Elkington, 1997).

However, for consumers as laypersons, the definition of sustainable brands is much more challenging. As sustainability is a credence attribute, consumers cannot base their assessment of sustainable brands on their own experience or observations but must rely on available information (Delmas & Grant, 2014). Thus, they find themselves in a high-noise environment in which many different brands disseminate different types of information (White et al., 2019).

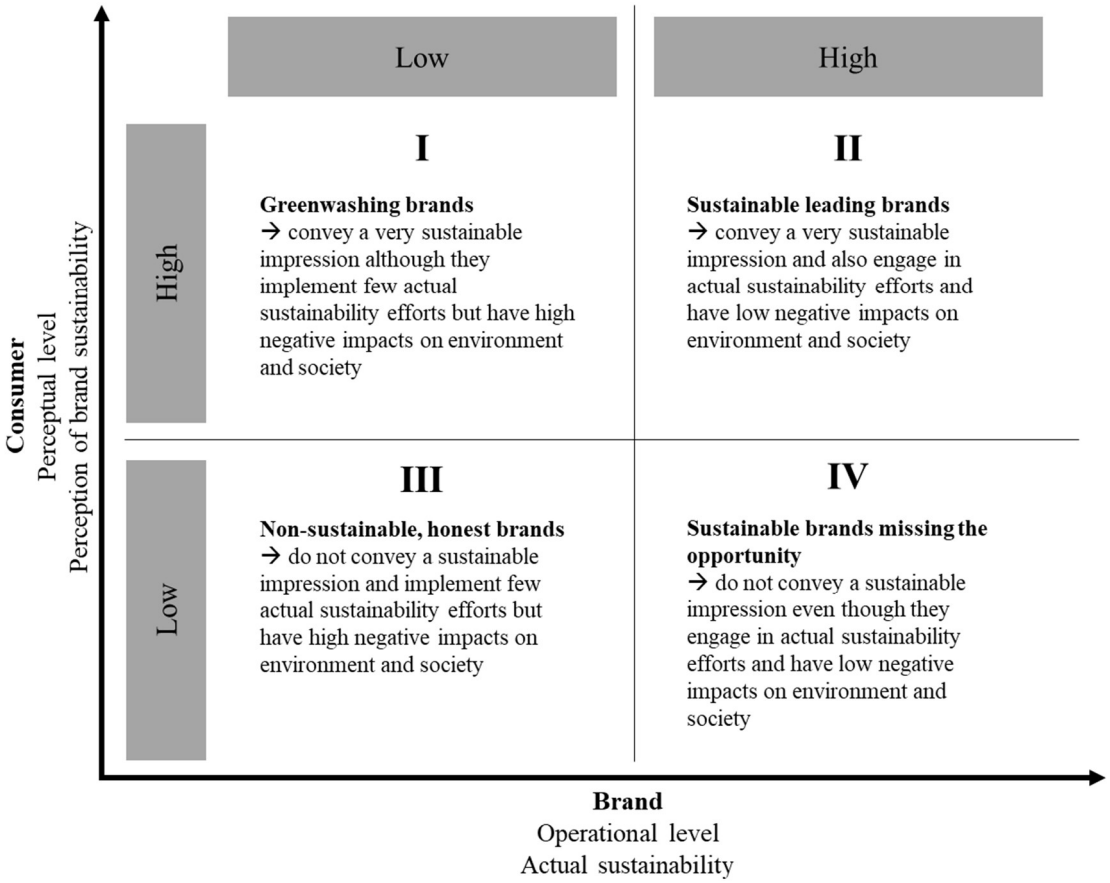
Additionally, the topic of sustainability is inherently complex and abstract, therefore sustainability information can be hard to understand (Reczek et al., 2018; Sokolova et al., 2023; White et al., 2019). Moreover, the motivation and cognitive ability of consumers to interpret this information is limited (Winterich et al., 2023). As a result, the bottom-up definition or perception of brand sustainability that consumers, as non-experts, have can differ substantially from the real sustainability of a product or brand (Peloza et al., 2012; Sokolova et al., 2023).

Since consumer perception is ultimately the basis for subsequent purchasing decisions (Mothersbaugh et al., 2020), considering both dimensions — the actual sustainability of brands and the perceived brand sustainability of consumers — can be beneficial for effective sustainability communication (Crittenden et al., 2011; Peloza et al., 2012; Sokolova et al., 2023). While sustainability information should be based on actual, objective indicators, brands can benefit from concurrently translating it for consumers as the target group of sustainability communication (Viciunaite, 2022). Therefore, researchers suggest understanding the very notion of sustainability bottom-up to effectively design sustainable products, services, and communications (Shultz et al., 2022).

The theoretical interaction of actual and perceived sustainability is shown in Figure 2-2 (Kapitan et al., 2019; Peloza et al., 2012): In the marketplace, there is still room for brands that score low on both dimensions and do not engage in sustainability communication, so that their actual sustainability efforts align with consumers' perceptions of low brand sustainability (see quadrant III in Figure 2-2). At the opposite end of the spectrum, depicted in quadrant II), some brands implement a high degree of sustainability and effectively communicate their leadership in sustainability to consumers (Carter et al., 2021). For both forms, the sustainability marketing strategy is aligned with the objective reality and perceived as authentic and honest (Szabo & Webster, 2021).

However, a mismatch between operational and communicational levels is inefficient or risky for brands. This mainly concerns brands that genuinely prioritize sustainability but do not

communicate it effectively. Hence, they do not benefit from their commitment (see quadrant IV). The above-mentioned problem also applies to brands that only pursue sustainability practices at a low level but are perceived as highly sustainable by consumers. These brands run the risk of being exposed as "greenwashers", which can disappoint or alienate consumers (see quadrant I; Kapitan et al., 2019).



Source: Own figure, adapted from Kapitan et al. (2019) and Peloza et al. (2012).

Figure 2-2. Brand sustainability matrix.

Given this relevance, it is surprising that research on the perceptual level of brand sustainability is scarce. The research findings that uncover disparities between reality and consumer perception highlight the need for a separate consumer-centric measurement of brand sustainability (Peloza et al., 2012; Sokolova et al., 2023). In their quantitative assessment, existing studies rely on expert definitions of the three pillars of sustainability (Baalbaki & Guzmán, 2016; Carter et al., 2021; Walsh & Beatty, 2007). Consequently, aspects extending beyond the three sustainability dimensions, such as transparency, credibility, or the incorporation of sustainability into the core of the brand, are largely disregarded. Therefore, the

present work sought to make measurable a more thorough understanding of brand sustainability.

The PST scale aims to capture consumer perceptions in a nuanced way and assists in examining their effects on attitudes and behaviors. Therefore, it contributes to the further systematic investigation of the relatively under-researched field of brand sustainability in consumer research. In addition, it can help brands understand their current sustainability status among consumers. By being able to capture their perceived sustainability, brands can purposefully develop this dimension along with their actual sustainability on their journey toward more sustainable development.

2.3 Measurement of consumer-perceived brand sustainability

2.3.1 Overview of the research process

To develop the brand PST scale, we followed a multi-method approach encompassing seven studies in total. As there was limited guidance about what specific characteristics influence consumers' perceptions of brand sustainability in the literature, we started with an inductive study to enable a solid conceptual foundation.

Thus, we followed a line of previous consumer-centric scale developments that explored relatively under-researched constructs (e.g., Baalbaki & Guzmán, 2016; Brunk, 2012; Öberseder et al., 2014; Walsh & Beatty, 2007; Warren et al., 2019). We maintained Churchill's (1979) well-known framework and used these consumer-centric scale developments for guidance on how to complement the consumer perspective. These scale developments were characterized by a desire to create a consumer-perceived measure of a construct that had hardly been studied. What they had in common was an explorative, inductive approach to generating an item pool (e.g., interviews or open-ended survey questions). We followed this approach while increasing the generalizability of the results using the method of automated text analysis (Berger et al., 2020; Heiberger & Munoz-Najar Galvez, 2021).

We started by identifying relevant aspects of brand sustainability from the consumer perspective through an automated text analysis (Study 1a). To ensure a solid theoretical foundation and construct clarity, we defined the consumer-relevant aspects identified in Study 1a by mapping them with the branding and sustainability (marketing) literature. Additionally, the findings were validated by consumer in-depth interviews (Study 1b). Based on this, we developed an item pool and conducted expert validation to ensure that it adequately mapped the insights from the consumer responses and literature. The initial 115 items were then

tested to generate the PST scale (Study 2a). After that, we demonstrated its convergence, predictive, discriminant, and nomological validity across multiple studies in different segments and countries (see Table 2-1 for a summary of the studies).

Study	Primary purpose	Sample	Methodology	Key findings
1a	Empirical identification of relevant aspects of PST	Germany[a] (N = 1404)	Open-ended survey questions; STM	Identification of 16 topics that shape PST
1b	Validation of PST dimensions from Study 1a	Germany (N = 16)	In-depth interviews; qualitative coding	All topics from Study 1a were found in interviews. Individual interviewees focused on few specific topics.
2a	Development of initial PST scale	Germany[a] (N = 406)	Item pool, quantitative survey; EFA	Initial PST scale covering all superordinated aspects
2b	Convergent validity in young consumer sample	Germany (N = 433)	Quantitative survey; CFA	Adequate psychometric properties and model fit
3	Convergent validity in the US and discriminant validity	USA[b] (N = 492)	Quantitative survey; CFA	Adequate psychometric properties, model fit, and discriminant validity against related but conceptually different constructs
4	Convergent validity in multiple countries and predictive validity compared to one-item measure	France[a], Hungary[a], Italy[a], Netherlands[a], Poland[a], Spain[a] (N = 3,978)	Quantitative survey; CFA	Adequate psychometric properties, model fit, and higher predictive validity compared to one-item measure
5	Nomological validity	USA[b] (N = 601)	Experiment; mediation analysis	Test of mediating role in a nomological framework

[a] Sample is representative for the respective country in terms of age, gender, and education.
[b] Sample is representative for the respective country in terms of age and gender.
STM = structural topic modeling; EFA = exploratory factor analysis; CFA = Confirmatory factor analysis.

Table 2-1. Overview of studies.

2.3.2 Study 1a: Automated text analysis to identify relevant aspects from the consumer perspective

The objective of the first study was to exploratively identify the key aspects of brand sustainability that were relevant to consumers. Since the primary aim of the PST scale was to authentically reflect the perspectives of consumers regarding what constitutes a sustainable brand, we chose consumer responses on open-ended survey questions as a data basis. For the analysis, we opted for STM to reduce the collected text data to a certain number of topics via

probabilistic algorithms (Shankar & Parsana, 2022). The STM model analyzes word co-occurrences and uses them to identify key topics that consumers discuss. The more frequently words occur together, the more likely they are to form a mutual topic (Heiberger & Munoz-Najar Galvez, 2021). Subsequently, the topics are quantitatively characterized by their most frequent and most probable words. Based on this, researchers can qualitatively interpret the labels and content of the identified topics (Shankar & Parsana, 2022).

This procedure has the advantage of combining two aspects that are crucial for the research goal of this study (Berger et al., 2020). The analysis relies on qualitative data collected through open-ended questions, in which consumers can freely articulate their individual view on sustainable brands (Roberts et al., 2014). Simultaneously, we employed a broad, representative approach with a sizable consumer sample to establish a sound foundation for the scale development process (DeVellis, 2017; Netemeyer et al., 2003). The approach enabled us to efficiently analyze a substantial amount of data while still capturing the nuances and depth of consumers' perceptions and opinions regarding sustainability aspects in the context of brands (Berger et al., 2020).

Study 1a procedure

To extract underlying aspects of PST, we conducted an online study with a sample of $N = 1{,}404$ participants (M_{age} = 41.60, 50.8% female, 49.2% male) that was largely representative of the German population in terms of age, gender, and education (details in the Appendix A1). In an international comparison ($N = 10{,}281$), German consumers were found to be in the mid-range in terms of their attitude and perception of sustainability with regard to consumption. This makes the sample an adequate, average basis for a measurement instrument that can be applied across countries (Global Sustainability Study; Simon Kucher and Partners, 2021).

An online questionnaire, which included open-ended questions on perceptions of sustainable brands, was distributed via social networks and a consumer access panel. The open-ended questions were as follows: (1) "*What comes into your mind when you think of sustainable brands?*"; (2) "*In your opinion, what characterizes a sustainable brand?*"; (3) "*How do you recognize a sustainable brand?*"; and (4) "*How should brands develop in the future to become more sustainable?*". The responses to these questions consisted of 45.26 words on average, resulting in a text corpus of 254,199 words.

As recommended in the literature, we pre-processed the data before further analysis (Heiberger & Munoz-Najar Galvez, 2021). In the first step, we removed common stop words

as well as two miscellaneous subject-related words ("sustainable" and "brand"). Additionally, we transformed tokens into bigrams and used the 50 most common bigrams to compute the topic models. To define the appropriate number of topics (k), we used semantic coherence and exclusivity as measures (Mimno et al., 2011; Roberts et al., 2014). The choice of these steps is described in Appendix A1.

Study 1a results

Relying on the described metrics, we identified $k = 16$ as the optimal number of topics. To analyze and label the extracted topics, we applied a two-step qualitative approach. First, three researchers separately labeled each topic based on the most frequent and most specific words, as well as the consumer text pieces with the highest Θ values (highest text–topic correspondence). In the second step, the researchers discussed deviations and agreed on the final labels. Table 2-2 provides an overview of the 16 identified topics and their prevalence, indicating the "mean proportion of words across the documents that are assigned to this topic" (Roberts et al., 2014, Online Appendix p.31), as well as the most probable and frequent and exclusive (FREX) words for the topics.

Topic + Label	(1) FREX words (2) most probable words	Preva-lence
1 Offering of sustainable products	(1) use, offer, longer, eventually, article, renewable energies (2) use, consumer, clothing, buy, offer, hold, article	.043
2 Sustainable standards along the supply chain	(1) role, plays, stay, play, reference, respected, Europe (2) set, role, supply chain, reference, transparent, stay, plays	.034
3 Green advertising	(1) advertising, communication, information, communicates, sees, certain, transparent (2) advertising, communication, customers, information, communicates, product, green	.054
4 No greenwashing	(1) falls, topic, actually, find, greenwashing, trend (2) topic, greenwashing, find, opinion, falls, trend, actually	.063
5 Transparent communication	(1) case, consumers, show, step, communicate, think, clear (2) company, consumer, transparency, think, case, communicate, customer	.053
6 Eco-friendly packaging material	(1) packaging, plastic, ingredients, paper, packaging material, packaged, marking (2) packaging, plastic, product, recognizes, packaging, ingredients,	.086
7 Priority of purpose over profit	(1) profit, longevity, develop, consumption, problem, value, place (2) develop, life, profit, produce, longevity, value, try	.048
8 Eco-friendly and socially fair practices	(1) nature, animals, pay, chemical, exploitation, just, strain (2) environment, nature, child labor, eco-friendly, fabrics, animals,	.063
9 Resource-saving production	(1) energy, water, use, raw materials, save, manufacture, use (2) manufacturing, production, resources, raw materials, materials, co2, energy	.128
10 Brands as agents of sustainable change	(1) future, money, world, think, pay, thoughts, ready (2) environment, future, think, world, companies, act, work	.050
11 Pricing and quality	(1) afford, expensive, fashion, quality, high, fashion, people (2) quality, expensive, environment, fashion, more expensive, afford, price	.049
12 Global standards	(1) draws, Germany, climate protection, question, purchase, countries, costs (2) company, cost, Germany, countries, climate protection, compliance,	.040
13 Acknowledgement of multi-dimensionality	(1) pursues, social, environmental, economic, goals, pursue, projects (2) social, ecological, goals, projects, aspect, aspects, environmental	.062
14 Sustainability labels	(1) seal, label, recognize, fairtrade, on it, label, organic (2) seal, recognize, organic, colors, most, label, product	.092
15 Durability and recycling	(1) products, durable, lifespan, recycle, recyclable, fair, resource-saving (2) products, production, produced, used, fair, produce, products	.110
16 Adaption to societal and environmental demands	(1) persist, acts, adjust, focus, trends, demands (2) deals, focus, product, exist, production, means	.025

Table 2-2. Overview of the extracted topics.

The five most prevalent topics were (1) *resource-saving production* (T9), (2) *durability and recycling* (T15), (3) *sustainability labels* (T14), (4) *eco-friendly packaging material* (T6), and (5) *eco-friendly and socially fair practices* (T8) and *no greenwashing* (T4) (sharing the rank with the same prevalence value).

The most prevalent topic, *resource-saving production* (T9) includes consumer thoughts regarding efficient energy or water use or the careful use of raw materials for production. This topic showed an average document-topic probability (prevalence) of 12.8%. *Resource-saving*

production was followed by *durability and recycling* (T15; 11.0%), which mainly addresses the longer lifespan of products that are offered by sustainable brands and recycling, as well as recyclable materials. The third most prevalent topic was *sustainability labels* (T14; 9.2%), which consumers mentioned in the context of recognizing products from sustainable brands. The words that made up this topic show how different labels (e.g., fair trade or organic labels) were of high importance for consumers in categorizing sustainable brands and their products.

Another aspect that mattered for consumers was *eco-friendly packaging material* (T6; 8.6%), in which they perceived sustainable brands as being cautious in their packaging and the material used (e.g., using paper instead of plastic packaging). In addition to packaging as a product characteristic, *eco-friendly and socially fair practices* associated with the production of a brand's products played a role (T8; 6.3%). Consumers addressed issues concerning nature and animals, chemical substances, and aspects of working conditions, such as child labor or exploitation. Both, the environmental as well as the social dimension of sustainability were present in the results. However, the two dimensions did not form two separate topics but rather appeared together in relation to sustainable practices.

Looking beyond the five most important topics, a mixed picture emerges that extends further than the concrete characteristics of brands and their products. For example, consumers showed a holistic understanding of sustainability (T12, T13) and addressed the normative orientation of brands (T7) and their role in sustainable change (T10). The importance of how brands should communicate their sustainability efforts was also highlighted by several topics (T3, T4, and T5).

2.3.3 Consolidation with literature

The consumer sample discussed a variety of different topics with regard to sustainable brands. They exemplify what is found in brand and sustainability research, albeit at times using different terminology (as the consumers expressed their thoughts using everyday language). Therefore, we assigned the extracted topics to different research areas and explain their theoretical relevance in the literature streams below.

In the multidisciplinary research field of sustainable consumer behavior, the research areas are interconnected, and some of the topics can be assigned to several research areas. However, for the purpose of a concise overview, they will be discussed in their most relevant contexts. Table 2-3 shows the respective research areas with the corresponding topics identified in Study 1a.

Research area	Literature stream	Topic from Study 1a
Sustainable offerings and practices	Branding	T1: Offering of sustainable products T6: Eco-friendly packaging material T8: Eco-friendly and socially fair practices T9: Resource-saving production T11: Pricing and quality T15: Durability and recycling
Sustainability communication and advertising	Branding, sustainability (marketing)	T3: Green advertising T4: No greenwashing T5: Transparent communication
Authenticity and credibility	Branding	T7: Priority of purpose over profit
Certification	Sustainability (marketing)	T14: Sustainability labels
Comprehensive approach	Sustainability (marketing)	T2: Sustainable standards along the supply chain T12: Global standards T13: Acknowledgement of multi-dimensionality
Sustainable brand personality	Branding	T10: Agents of sustainable change T16: Adaptation to societal and environmental demands

Table 2-3. Relevant aspects for PST classified into research areas.

Most of the extracted topics relate to specific sustainable attributes of a brand's *sustainable offerings and practices*. In the branding literature, brands are commonly conceptualized as abstract entities (e.g., Fournier, 1998). To form an image of an abstract brand, consumers often use concrete cues, such as a brand's offering. Sustainable product offerings thus serve as a tangible representation of a brand's sustainability efforts (Brown & Dacin, 1997; Torelli et al., 2012). They indicate that when it comes to specific sustainable product attributes, such as fair production or resource-friendly manufacturing, brands prioritize sustainability (Sander et al., 2021). The STM showed that specific sustainable practices mentioned by the consumers — such as recycling (T15), the use of sustainable packaging materials (T6) and resource-saving production (T9) — were closely associated with sustainable brands in the consumers' minds.

In order to inform consumers about sustainable products and practices, *sustainability communication and advertising* play a decisive role (Viciunaite, 2022). This research area is also prevalent in different topics, such as the absence greenwashing (T4) or transparent communication (T5). If implemented effectively, sustainability communication serves as a means of building awareness, and trust in the brand's efforts (Rahman & Nguyen-Viet, 2023). In our study, for example, consumers expressed difficulties in identifying the true sustainability of brands, as they had become skeptical due to many greenwashing examples. In this respect,

they mentioned transparency as indispensable for establishing trust. The literature supports this notion, indicating that for sustainability communication to resonate with consumers, content needs to be balanced with communicational aspects, such as transparency and comprehensibility (Viciunaite, 2022).

Associated with this, *credibility and authenticity* were often mentioned by the consumers. For example, one respondent wrote "Most importantly, the brand must convey a certain level of willingness to engage with the issue, and this willingness must be credible." Similarly, the branding literature emphasizes the importance of authenticity and credibility for (sustainable) brands (Cinelli & LeBoeuf, 2020; Erdem & Swait, 2004). A brand's offerings or practices are usually not evaluated as independent components on their own but rather in relation to the brand (Campbell & Winterich, 2018; Mena et al., 2019). The same applies to the sustainability efforts a brand takes that should authentically fit the brand image (Wang et al., 2017).

Prior studies have indicated that consumers do not universally reward every sustainability initiative. Instead, consumers demand that brands demonstrate credibility, authenticity and a non-opportunistic approach to sustainability (Baalbaki & Guzmán, 2016; Crittenden et al., 2011). For brands to be recognized as authentic and credible, they need to be perceived as willing and able to keep their promises (Erdem & Swait, 2004). This means that they are genuinely committed to practices and values that go beyond mere marketing rhetoric (Morhart et al., 2015). In particular, this was evident in the topic of "priority of purpose over profit" (T7). Additionally, a brand needs to have the necessary resources, infrastructure, and expertise to transform its promises into measurable results (Dangelico & Pontrandolfo, 2015).

In this regard, research discusses several factors influencing the perceived authenticity and credibility of a brand's sustainability efforts, including the implementation of concrete environmental and social practices (Kumar & Christodoulopoulou, 2014), consistent engagement over time (Schallehn et al., 2014), transparent reporting (Dando & Swift, 2003), and certification of sustainability efforts (Delmas & Grant, 2014).

The sustainability (marketing) literature also addresses this point. The *certification* of sustainability efforts and its impact on consumers is a strongly examined topic in sustainability research. Certifications offer a standardized framework to verify the sustainability performance of brands (Delmas & Grant, 2014). Thus, they are a specific form of sustainability communication and represent a simple cue for identifying sustainable offerings (White et al., 2019). They establish specific criteria that brands need meet to receive a particular certification and use the corresponding labeling.

From a consumers' perspective, this typically creates an impression of commitment and accountability through independent confirmation of the sustainability claims made by the brand (Dando & Swift, 2003). The consumers in Study 1a wrote extensively about certifications, mentioning them predominantly as signals of credibility and transparency (T14: Sustainability labels). Consequently, certifications serve to strengthen consumer trust and differentiate brands by enhancing their credibility, particularly in cases in which greenwashing may be present (Delmas & Grant, 2014).

Additionally, the consumers in Study 1a showed a rather holistic understanding of the sustainability dimensions. One of the identified topics (T13: Acknowledgement of multi-dimensionality), for example, deals with the notion that it is important for a truly sustainable brand to comprehensively implement all the dimensions of sustainability. The consumers also considered global standards (T12) or regulations along the entire supply chain (T2) to be important. For instance, one respondent wrote, "In my opinion, a sustainable brand is characterized by more than just activities carried out here and there to promote the topic of sustainability. It is much more about implementing an overall sustainable positioning. I believe […] a broad sustainability strategy that combines all sustainability components is indispensable."

This is largely consistent with what is defined in the literature as a *comprehensive sustainability approach*. It refers to an all-encompassing strategy that considers multiple dimensions of sustainability and parts of the value chain (Gupta et al., 2013; Peloza et al., 2012). With respect to a sustainable brand and its effect on consumers, a comprehensive approach strengthens a coherent and credible impression of a genuinely sustainable brand (Carter et al., 2021). In addition, considering various aspects and stakeholders signals an ongoing commitment and striving toward ambitious goals which enhances the trustworthiness of a brand's sustainability efforts (Mena et al., 2019).

Finally, consumers in Study 1a mentioned how brands can act as agents of sustainable change (T10). Several consumers demanded sustainable brands to be pioneers driving sustainable change. One respondent stated "Sustainable brands should not only communicate their sustainability efforts, but they can also try to spread the sustainable lifestyle they exemplify to their customers." The consumer responses assigned to this topic also emphasize that brands having embedded sustainability deep in their core can act as frontrunners (Belz & Peattie, 2012). The branding literature also examines the phenomenon that brands can be perceived as guiding partners to rely on in complex environments (Fournier, 1998). In this

context, brands are conceptualized as entities with human-like characteristics that can embed sustainability in their values and personalities (Gupta et al., 2013; Torelli et al., 2012).

If a brand is perceived as having a *sustainable brand personality*, it is also likely to be perceived as genuinely committed to the cause (e.g., by demonstrating dedication to sustainability alongside pure profitability or incorporating sustainability as a core competency; Crittenden et al. 2011; Rahman and Nguyen-Viet 2023). In this sense, a sustainable brand personality expresses that a brand has successfully implemented sustainability attributes, practices, and communications to such a degree that it is perceived as an inherent brand characteristic (Sander et al., 2021).

The alignment of the topics with well-established research areas empirically underscores the limitations of narrowly focusing on predefined sustainability definitions, such as the Triple Bottom Line, in fully comprehending consumer perceptions. The forthcoming development of a brand PST scale will bridge this gap by interconnecting research areas from various literature streams with the aspects uncovered through our exploratory analysis.

2.3.4 Study 1b: Validation of aspects

Study 1b procedure

The aim of Study 1b was to empirically validate the consumer-relevant aspects identified through the automated text analysis. This validation process verified the topics and ensured that no significant aspects are omitted during the scale development process. We conducted 16 thematic in-depth interviews using a guideline developed based on the automated text analysis. A quota plan was employed to ensure that both male and female consumers from various age groups were interviewed (see Appendix A2). Subsequently, the interviews were thematically coded, and the mentioned aspects were assigned to the identified topics.

Study 1b results

All the topics from the automated text analysis were also addressed by consumers in the interviews (please find the distribution of topics across participants in Appendix A2). However, the interviews revealed that individual consumers have a significantly narrower understanding of sustainable brands, focusing on specific aspects. While the consumer sample in Study 1a collectively demonstrated a comprehensive understanding, individual interview participants tended to emphasize particular aspects. Together, the 16 interviewees addressed all the topics identified in Study 1a. Primarily, consumers mentioned specific product attributes or sustainable practices that they associate with sustainable brands. Additionally, the topic of

communication, along with authenticity and credibility, was extensively discussed emphasizing the necessity of integrating these aspects into a PST scale.

Moreover, in the interviews, the aspect of regional sourcing was mentioned multiple times as a characteristic of sustainable brands. However, this was exclusively related to sustainable food products. As the scale was intended to be uniformly applicable across various sectors and this specific aspect can be allocated to the topic of "eco-friendly and socially fair practices," it was not included as a separate topic.

2.3.5 Study 2a: Initial administration

Based on the insights from the automated text analysis and the interviews, a traditional scale development process followed. Thus, Study 2a addressed the following objectives: (a) generating an item pool that covers the consumer-relevant aspects and respective research areas, and (b) identifying an optimal subset of scale items.

Item generation

We initially compiled a list of 136 items (each assigned to one of the extracted topics from Study 1a) based on the findings from our two consumer studies and prior literature. Six research experts in the domain of marketing and sustainable consumer behavior judged this set of items after being introduced to the purpose of the scale development process. The experts provided feedback on the representativeness of the items for their intended dimensions of measurement ("For each of the items, please indicate how well it represents the idea of each dimension;" 7-point scale, *1= very poor - 7 = very good*). They could also modify, add, or eliminate items. Items were eliminated or modified if their mean rating fell below five, at least one expert rated it as "very poor," or two more experts rated it below the midpoint of the scale (e.g., Morhart et al., 2015). This resulted in a final set of 115 items.

Study 2a procedure

A sample of 406 consumers located in Germany (M_{age} = 49.18, 50.5% female, 49.5% male) participated in the online study. The participants were recruited from a consumer access panel and rated one of six brands from different product categories that were popular in Germany (cleaning supplies: Frosch and Sagrotan; cosmetics: Weleda and Nivea; food retailer: Alnatura and Rewe). The brands represented pairs of a highly sustainable and a rather sustainability-neutral example from the same category.

In a pretest, we ensured that the chosen brands significantly differ in their perceived sustainability using a one-item measure as proxy. The participants ($N = 76$) were presented with well-known brands from these product categories (i.e., food retailers, cosmetics, and cleaning supplies), which they were asked to rate on a seven-point scale from unsustainable to sustainable. For each product category, pairs of brands were then identified in which one brand was perceived as less sustainable than the other (mean difference of at least >1).

In the main study, participants were randomly assigned to one of the six brands and indicated their level of agreement with the initial 115 items (e.g., "[Brand name] not only takes environmentally friendly practices into account but also the social aspects of sustainability.", seven-point scale, *1 = strongly disagree – 7 = strongly agree*). Details of the pretest and procedure are presented in Appendix A3.

Study 2a results

We conducted an exploratory factor analysis (EFA) to reduce the set of 115 items. An initial EFA revealed that one primary factor emerged from the set of items (with an eigenvalue of 83.23), explaining 74.98% of the variance. To select items, we relied on common criteria (item-to-total correlation >.35, average interitem correlation >.30, factor loading >.60; cross loading <.30; Comrey & Lee, 1992; Netemeyer et al., 2003). Items that did not meet these criteria were removed, and the EFA was rerun. However, as noted by Netemeyer et al. (2003), "we are also unaware of definitive guidelines regarding what constitutes a high loading on a construct other than the intended construct (i.e., a 'cross-loading')" (p. 155). Therefore, we balanced our assessment of these quantitative criteria with a qualitative assessment of the unique conceptual contribution of each item.

In one case, we retained an item with a factor loading of .568 to account for the theoretically important dimension of a sustainable brand personality. Additionally, we were also careful to avoid selecting multiple items that were strongly conceptually redundant, to cover the detected conceptual breadth of the assessed consumer perceptions without excessively increasing the number of items. Based on this rationale, six items were deleted. If several items measuring the same dimension met all the criteria, we retained the one with the highest factor loading in the EFA.

In addition, to test the adequacy of these decisions, a confirmatory factor analysis (CFA) was performed using AMOS 27. We compared a measurement model containing all 17 items identified by the EFA and one with 11 items after the removal of substantively redundant statements. To evaluate the model fit, we relied on a set of indices and threshold values

suggested in the literature: normed χ^2 (<5.0), comparative fit index (CFI ≥ .95), Tucker–Lewis index (TLI ≥ .96), normed fit index (NFI ≥ .90 or .95, according to the source), root mean square error of approximation (RMSEA ≤ .06), and standardized root mean square residual (SRMR ≤.08; Hu & Bentler, 1999). The scale version with 11 items had a better model fit, and a chi-square test indicated a significant model improvement due to the reduction of substantively redundant items (details in Appendix A3).

Importantly, we only made exceptions to the quantitative threshold guidelines when the overall integrity of the factor was maintained, as evidenced by Cronbach alphas comfortably exceeding the .70 threshold recommended by Nunnally and Bernstein (1995). This resulted in a final scale of 11 items (α = .961) as displayed in Table 9-8 in Appendix A3.

The scale thus covers a wide range of topics and integrates the various areas identified in previous research into the one-dimensional construct of PST. Based on previous research on how consumers perceive the sustainability dimensions, the emergence of a multidimensional construct would have been conceivable as well (Luchs & Miller, 2015). However, the result of a one-dimensional scale covering several theoretical dimensions imply that they are perceived by consumers as a unit. Such a simultaneous consideration of numerous aspects under the umbrella term of sustainability has also been found in prior research (e.g., Barone et al., 2020). Not only the results from this study, but also those of Study 1a support this view.

2.3.6 Study 2b: Validation of the scale

The aim of this study 2b was to test the convergent validity of the PST with another sample. To do so, we opted for a sample of young consumers, as they represent a particularly sustainability-conscious consumer group (White, Habib, and Hardisty 2019).

Study 2b procedure

We presented the participants from Germany (N = 416) with a commercial video containing information about the sustainability of different brands (i.e., Alnatura, food retailer; Bionade, drinks; and Weleda, cosmetics). Participants (Alnatura: N = 145, M_{age} = 26.00, 68.3% female, 31.7% male; Bionade: N = 154, M_{age} = 25.34, 53.9% female, 46.1% male; Weleda: N = 117, M_{age} = 24.64, 59.8% female, 40.2% male) then rated the brands on the PST scale items (seven-point scale, anchored 1 = *strongly disagree,* 7 = *strongly agree*).

Study 2b results

To compare the PST factor structure between subsamples, metric invariance needed to be established. Therefore, we compared the fit of three models to examine different degrees of invariance (i.e., configural, metric, and scalar invariance; Chen, 2007). The CFA with scalar invariance (i.e., strong invariance) met the suggested criteria, revealing satisfactory psychometric properties of the PST scale for each subsample (Appendix A4 for details).

2.3.7 Study 3: Validation in the English language and discriminant validity

The aim of Study 3 was to create and validate an English version of the scale based on a sample of US consumers. This was to provide an adequately worded English version (Haws et al., 2023) and to ensure that the scale works reliably in a frequently studied cultural space (DeVellis, 2017). Additionally, discriminant validity was assessed with regard to other related constructs that may overlap with PST but have conceptual differences to (empirically) demonstrate their distinctiveness.

PST is also conceptually distinct from consumer-perceived corporate social responsibility (CSR), perceived greenwashing, corporate reputation, perceived brand authenticity, and brand credibility as well as from a green brand image. For a summary of the conceptual differences with non-exhaustive example references, see Table 2-4.

Construct	Example reference	Definition	Differences with PST
Corporate Social Responsibility	Brown & Dacin(1997); Fatima & Elbanna(2023)	Encompasses a range of prosocial actions beyond the primary business operations (e.g., maintaining stakeholder relations, engaging in philanthropy). CSR activities are often unrelated to products.	BST focuses on an overarching concept incorporating different sustainability aspects into the brand, including its sustainability in operations, products, and marketing strategies.
Green brand image	Chen (2010); Rahman & Nguyen-Viet (2023)	Set of perceptions about a brand's focus on environmental commitment. It can be considered a subdimension of the overall brand image.	BST applies an overarching understanding of sustainability, including social and communication-related aspects. Green brand image solely covers the environmental dimension of sustainability.
Perceived greenwashing	Leonidou & Skarmeas (2017); Szabo & Webster (2021)	Extent to which a brand is engaging in deceptive sustainability practices. Perception of a disconnect between sustainability communications and actual performance.	BST focuses not only on communicational aspects and goes beyond the alignment of communicative and operational practices.
Corporate reputation	Hur et al. (2014); Walsh & Beatty (2007)	Intangible asset of a brand that serves as a signal for consumers to judge products or services of the company. It can serve a protection from consumer perceptions of negative information.	BST is not as broad as corporate reputation but focuses particularly on aspects related to the sustainability reputation of a brand.
Brand authenticity	Cinelli & LeBoeuf (2020); Morhart et al. (2015)	Extent to which a brand's actions matches what the brand claims to be. According to Morhart et al. (2015), an authentic brand is consistent over time, delivers what it promises, represents certain values, and its actions reflect the values it communicates.	Both concepts focus on transparency and a match between communication and actions. However, BST more specifically focuses on authentically implementing and communicating sustainability efforts.
Brand credibility	Erdem & Swait (2004)	Perception of trustworthiness toward a brand. It includes dimensions such as reliability, authenticity and ability. Can be built through diverse aspects such as transparent communication, quality, or ethical business practices.	Individual aspects of brand sustainability relate to brand credibility, but brand credibility extends beyond sustainability aspects. BST places a stronger emphasis on explicit sustainability aspects.

Table 2-4. Differences between brand sustainability and related constructs.

Study 3 procedure

To test the PST scale in English, the developed items were double back translated into English by professional translators. A representative sample of 492 US consumers (M_{age} = 41.18, 48.6% female, 49.0% male, 2.4% nonbinary) participated in an online study on Prolific and rated one of two brands (Whole Foods and Target).

Similar to Study 2a, we conducted a pretest to identify a brand pair that differed in its perceived sustainability (details on the pretest in Appendix A5). The participants completed the

PST scale as well as scales on perceived CSR (36 items from Öberseder et al., 2014), green brand image (five items from Chen, 2010), perceived greenwashing (five items from Leonidou & Skarmeas, 2017), corporate reputation (three items from Hur et al., 2014), brand authenticity (two items from Cinelli & LeBoeuf, 2020), and brand credibility (seven items from Erdem & Swait, 2004).

To account for potential common method bias, we used procedural and statistical remedies (Podsakoff et al., 2003). We employed a range of scales, pre-validated the questionnaire, ensured participants of their anonymity and data confidentiality, stressed that there were no wrong or right answers (to minimize the potential for self-presentation bias), and randomized the arrangement of items (Hulland et al., 2018). Additionally, we conducted Harman's single-factor test and employed the unmeasured latent method factor approach (Podsakoff et al., 2003). Overall, the results suggest that common method variance did not pose a serious threat to our results.

To confirm the discriminant validity of PST and these constructs, we (a) conducted a heterotrait–monotrait (HTMT) analysis (Henseler et al., 2015), and (b) compared the squared average variance extracted (AVE) values of the constructs with the correlations between the construct pairs (Fornell & Larcker, 1981). For the HTMT ratio, values below .85 or .90 were considered adequate (Henseler et al., 2015). Moreover, according to the Fornell–Larcker criterion, discriminant validity is established when the correlations between the constructs are lower than the square root of the AVE (Fornell & Larcker, 1981).

Study 3 results

First, we performed both a CFA for the whole sample and a multi-group CFA with metric measurement invariance between the two groups. All models had an acceptable fit and satisfactory psychometric properties (see Appendix A5). Second, we estimated CFA models for PST and the other concepts to test their discriminant validity.

All constructs (except for green brand image) met both criteria. For green brand image, the HTMT ratio (.88) was below the more liberal threshold of .90, and according to the Fornell-Larcker criterion, discriminant validity can be partially confirmed. Green brand image and PST are conceptually very similar and differ only in that PST also includes other aspects of sustainability than environmental ones and places greater emphasis on communication and authenticity. Details of the discriminant validity tests are summarized in Appendix A5.

2.3.8 Study 4: Convergent validity in multiple countries and predictive validity

The objective of Study 4 was to validate the PST scale in six European countries to ensure applicability across various countries and validation in other languages (DeVellis, 2017; Haws et al., 2023). Additionally, the predictive validity of the PST scale was compared to a one-item measure. Whereas the one-item measure ("*How sustainable do you perceive this brand?*"; seven-point scale, 1 = *not sustainable at all* – 7 = *very sustainable*) provides a simple measure with minimal participant burden, the PST scale offers a more nuanced assessment of brand sustainability (Bergkvist & Rossiter, 2007). To assess their predictive validity, we opted for purchase intention and product attitude as dependent variables for which the positive effects of PST could be expected in the realm of (food) retailers (Carter et al., 2021).

Study 4 procedure

The German version of the PST scale was double back translated into the respective national languages. To avoid the need for linguistic modification for future research, the translated versions of the scale can be found in Appendix A6 (Haws et al., 2023). We distributed an online survey to consumer samples in France ($N = 603$, $M_{age} = 50.44$, 51.7% female, 48.1% male, 0.2% nonbinary), Hungary, ($N = 607$, $M_{age} = 46.28$, 52.4% female, 47.3% male, 0.3% nonbinary), Italy ($N = 590$, $M_{age} = 50.29$, 51.5% female, 48.5% male), the Netherlands ($N = 596$, $M_{age} = 46.94$, 50.5% female, 49.3% male, 0.2% nonbinary), Poland ($N = 466$, $M_{age} = 44.19$, 51.7% female, 48.3% male), and Spain ($N = 1077$, $M_{age} = 48.82$, 51.7% female, 48.3% male) via a consumer access panel. The demographic data represent the proportional distribution with regard to age, gender, and education for each country. To reflect the European consumer market, we selected the five largest consumer markets and added Hungary to represent Eastern Europe.

Each participant read a short description of a national brand in the food sector containing some basic sustainability information about their value chain and products. The participants then responded to some general attitudinal variables about the brand and its product, including purchase intention for the products of the brand (two items from Zolfagharian et al., 2017) and attitude toward the brand's product (five items from Schroll et al., 2018). After that, a part of the survey on the sustainability of the brand followed, which included the PST scale items.

We employed the same procedural and statistical remedies to account for common method bias as in Study 3 and no problems were identified.

Study 4 results

For each country, we separately performed a CFA including the latent factors of PST, purchase intention, and attitude toward the brands. Each of the CFA models had an acceptable fit and satisfactory psychometric properties. Additionally, as in Study 2b, we tested a multi-group CFA for all countries on measurement invariance. For all subsamples, the multigroup model with scalar invariance showed satisfactory psychometric properties for the PST scale (details can be found in Appendix A6).

Following prior literature (Bergkvist & Rossiter, 2007), we estimated the effect of PST on both dependent variables and compared the size of correlations and explained variance. Additionally, we performed Meng, Rosenthal, and Rubin's (1992) test to compare correlation coefficients. For both dependent variables across all countries, the correlations with the PST scale were higher than with the one-item measure (indicating a closer fit to the "true correlation") and the PST scale explained more of the variance in the dependent variables (Bergkvist & Rossiter, 2007).

With one exception, all correlations differed significantly according to Meng et al.'s test (see Appendix A6). Therefore, this study not only validated the generalizability of the scale across different languages and cultural contexts but also demonstrated its improved performance compared to a one-item measure.

2.3.9 Study 5: The mediating role of PST in a nomological framework

The aim of Study 5 was to evaluate the nomological validity of the PST construct as a mediator and its role in shaping consumers' choices (Nunnally & Bernstein, 1995). To provide a strong basis for testing the newly developed construct (Netemeyer et al., 2003), we built upon a conceptual framework that was well-established from a theoretical perspective (e.g., Haws et al., 2014; Kunda, 1990; Verplanken & Holland, 2002).

We assumed a mediating role of the PST construct, which converts the actual sustainability efforts of brands into more favorable consumer responses, based on their perception of these efforts (as depicted in Figure 2-3). In addition, we also expected PST to be higher for consumers with a sustainable self-identity. This assumption was based on the theoretical account of motivated reasoning, which is well-established in the literature on sustainable consumer behavior (e.g., Haws et al., 2014).

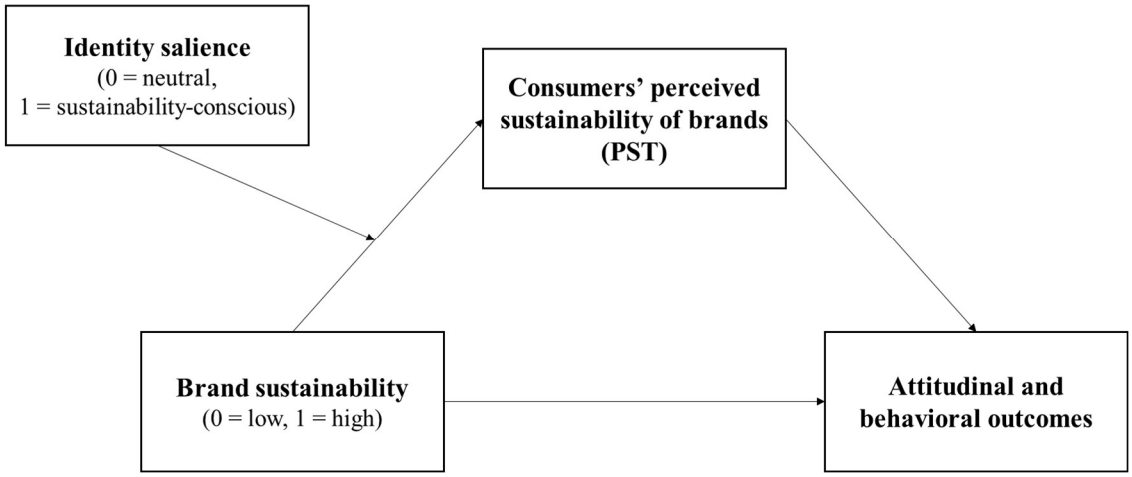


Figure 2-3. Nomological framework for PST.

Nowadays, consumers live in a marketplace that is characterized by a growing awareness of environmental as well as social sustainability (White et al., 2019; Winterich et al., 2023). Even though not all consumers are particularly sustainability-conscious, most people have been confronted with the concept of sustainability at some point, and thus, the topic is influencing most consumers to at least some extent. Therefore, brands are no longer solely evaluated based on their products, quality, aesthetics, and other relevant characteristics but also by their engagement in environmental and social causes (Gupta et al., 2013).

Most people generally feel positively about decisions and behaviors that promote sustainability (Venhoeven et al., 2020). Thus, if other characteristics of the brand, such as expertise or product range, are kept constant, brand sustainability is seen as an additional benefit of the brand in very large parts of society (Gupta et al., 2013; Kumar & Christodoulopoulou, 2014). Therefore, a positive effect on attitudes and behavior toward the brand can be expected. This is not only because brands are implementing concrete sustainability efforts, but also because consumers recognize and perceive brands as sustainable (Sánchez-Chaparro et al., 2022). When consumers perceive a brand as genuinely committed to sustainability, it means that the brand is implementing its sustainability strategy in a way that resonates with consumers as being suitable and authentic (Kapitan et al., 2019).

This is essential because consumers as laypersons do not ultimately base their decisions purely on objective facts but are influenced in their decisions by their individual perceptions in particular (Mothersbaugh et al., 2020; Winterich et al., 2023). Thus, PST drives the positive effect of actual brand sustainability and is an underlying mechanism that explains the positive effect of brand sustainability. We therefore hypothesize:

H1 *Consumers will show (a) better brand evaluations, (b) higher purchase intentions, (c) higher anticipated quality, (d) improved WOM, and (e) a more positive behavioral response for a more (compared to a less) sustainable brand, and these effects will be mediated by a higher PST.*

Closely related to the mediating role of PST is the concept of motivated reasoning. It is defined as "a desire to think about and evaluate information in a way that supports a particular directional conclusion" (MacInnis & Mello, 2005, p.6). Research on motivated reasoning with regard to sustainable consumer behavior finds that individuals engage in biased evaluations of (sustainability) information in a way that aligns with their pre-existing beliefs (Haws et al., 2014; Winterich et al., 2023).

Consumers that have incorporated sustainability-consciousness into their self-identity may thus exhibit motivated reasoning by selectively interpreting information about a brands' sustainability efforts. Highly sustainability-conscious consumers place priority on sustainable brand engagement and typically look for information on actual sustainability practices (Verplanken & Holland, 2002). They look for brands that align with their values, so that information about sustainability resonates particularly positively and strongly with them. Additionally, they interpret brand sustainability information differently from consumers who do not have value-consistent consumption motives (Kunda, 1990; MacInnis & Mello, 2005; Winterich et al., 2023). Therefore, information on actual brand sustainability should have a stronger influence on sustainability perceptions for this consumer group. Based on this consideration, we hypothesize:

H2 *The positive effect of manipulated brand sustainability on PST will be significantly stronger for consumers with a strong sustainability-identity.*

Study 5 procedure

To test the hypothesis, we recruited 601 US consumers (M_{age} = 41.71, 49.8% female, 47.8% male, 2.4% nonbinary) to complete an online survey on Prolific. The experimental design was a 2 (brand sustainability: low vs. high) x 2 (self-identity salience: neutral vs. sustainability-conscious) between-subjects design. The participants were randomly assigned to one of four conditions.

First, we primed the target (sustainability conscious) or a neutral identity (Bhattacharjee et al., 2014; Reed, 2004). In the sustainable (neutral) condition, participants were presented

with a definition of sustainable (general) consumer behavior. They were then asked to imagine a sustainability-oriented (general) consumer and brainstorm some factors that influence his/her consumption decision. They also listed three reasons why acting sustainably is important (three considerations when shopping for everyday items) and wrote a few sentences about the last action related to sustainability they performed (their last purchase decision).

The identity salience manipulation worked as intended, with higher reported levels of consciousness for sustainable consumption (six items from Balderjahn et al., 2018) in the sustainability identity conditions compared to the neutral conditions ($M_{neutral}$ = 5.46, SD = 1.25; $M_{sustainable}$ = 5.82, SD = 1.15; $F(1, 599) = 13.85$, $p < .001$).

Next, the participants proceeded to an ostensibly unrelated survey part about a fashion brand. To manipulate brand sustainability, we presented information about a fictitious fashion brand. The stimuli contained general information on the brand, its expertise and quality that was held constant across the groups. The stimuli differed in their brand name (Elo Vogue vs. Eco Vogue), color (gray vs. green) and information on sustainability (no vs. yes).

The participants indicated their brand evaluation (three items from Goldsmith et al., 2000), purchase intention (three items from, Meng & Chan, 2022), anticipated quality (two items adapted from Erdem & Swait, 2004), and word-of-mouth (WOM) intention (three items from Maxham & Netemeyer, 2002) on seven-point Likert scales. They then rated the fictitious brand using our PST scale.

Additionally, we included a behavioral proxy into our experiment. At the end of the survey, the participants were offered the option of viewing more information about the presented brand. Participants could opt in or out and were explicitly told that viewing the additional information was voluntary. We then used the choice of the additional information as a proxy for a higher willingness to actively engage with the brand.

Study 5 results

We first compared the mean values of the dependent variables between the less and more sustainable brand using ANOVAs and a chi-square test. This showed a better outcome for the sustainable brand all dependent variables: brand evaluation (BST_{low} = 4.99, BST_{high} = 5.38, F = 23.74, $p < .001$), purchase intention (BST_{low} = 3.90, BST_{high} = 4.57, F = 25.58, $p < .001$), anticipated quality (BST_{low} = 5.13, BST_{high} = 5.33, F = 4.28, p = .039), WOM intention (BST_{low} = 4.09, BST_{high} = 4.69, F = 21.12, $p < .001$), and the behavioral response (additional information selected: BST_{low} = 39.7%, BST_{high} = 60,3%, χ^2 = 5.30, p = .014).

The hypothesized nomological framework was then tested using the PROCESS bootstrapping macro (model 4) with PST as a mediating variable (see Table 2-5). An inspection of the mediation model (examining the direct effect of actual brand sustainability on the different dependent variables as well as the mediation via PST) showed that, in line with H1, the consumer responses were more favorable toward the sustainable brand. This effect was (partially) mediated by a higher PST. The total effect was significantly positive for all dependent variables.

Additionally, we tested the moderation of the a-path (the total effect of the independent variable on the moderator) by the identity salience (neutral vs. sustainability-conscious), using PROCESS model 7. We found a positive moderation on PST indicating that the effect of actual brand sustainability is more positive for sustainability-conscious consumers. The index of moderated mediation via PST was significant for all dependent variables: brand evaluation (.21, *SE* = .11, $CI_{95\%}$: [.003; .42]), purchase intention (.26, *SE* = .13, $CI_{95\%}$: [.004; .51]), anticipated quality (.16, *SE* = .08, $CI_{95\%}$: [.002; .33]), WOM intention (.28, *SE* = .14, $CI_{95\%}$: [.004; .54]), and the behavioral response (.16, *SE* = .09, $CI_{95\%}$: [.003; .29]). Thus, Study 5 embedded PST in a theoretically founded nomological framework and confirmed the nomological validity of the PST scale through corresponding effects.

	Brand evaluation	**Purchase intention**	**Anticipated quality**	**WOM intention**	**Behavioral response**
			Mediation model, PROCESS Macro Model 4		
DV ← BST	*b* = -.22, *p* = .08	*b* = -.28, *p* = .03	*b* = -.40, *p* = .002	*b* = -.42, *p* = .01	*b* = -.06, *p* = .80
PST ← BST	*b* = 1.38, *p* < .001	*b* = 1.38, *p* < .001	*b* = 1.38, *p* < .001	*b* = 1.38, *p* < .001	*b* = 1.38, *p* < .001
DV ← PST	*b* = .56, *p* < .001	*b* = .69, *p* < .001	*b* = .44, *p* < .001	*b* = .74, *p* < .001	*b* = .43, *p* < .001
Total effect	*b* = .55, *p* < .001	*b* = .67, *p* < .001	*b* = .55, *p* < .001	*b* = .60, *p* < .001	*
			Moderated mediation model, PROCESS Macro Model 7		
DV ← BST	*b* = -.22, *p* = .06	*b* = -.28, *p* = .04	*b* = -.40, *p* < .001	*b* = -.42, *p* = .002	*b* = -.06, *p* = .80
PST ← BST	*b* = 1.20, *p* < .001	*b* = 1.20, *p* < .001	*b* = 1.20, *p* < .001	*b* = 1.20, *p* < .001	*b* = 1.20, *p* < .001
DV ← PST	*b* = .56, *p* < .001	*b* = .69, *p* < .001	*b* = .44, *p* < .001	*b* = .74, *p* < .001	*b* = .43, *p* < .001
BST x Identity	*b* = .37, *p* = .04	*b* = .37, *p* = .04	*b* = .37, *p* = .04	*b* = .37, *p* = .04	*b* = .37, *p* = .04

Note: DV = dependent variable; * Total effects are not available for dichotomous dependent variables.

Table 2-5. Results of the (moderated) mediation model (Study 5).

2.4 Discussion and conclusion

2.4.1 Contribution to the literature

Consumers react to brands based on how they perceive them (Mothersbaugh et al., 2020; Sánchez-Chaparro et al., 2022). As prior research has shown that consumers' sustainability perceptions are biased (Peloza et al., 2012; Sokolova et al., 2023; Winterich et al., 2023), it is crucial to consider PST in both research and practice. We aimed to promote this by providing conceptual and empirical insights into which aspects consumers consider when forming their perception of a sustainable brand, as well as by presenting a scale to measure the PST construct. Thus, this work contributes to research in several ways.

First, we enrich the literature on sustainable consumer behavior and marketing by documenting aspects that are important to consumers when conceptualizing brand sustainability. With this, we address the call to incorporate consumers bottom-up understanding of (brand) sustainability (Shultz et al., 2022). As a first study, we leveraged consumer survey text data to derive the aspects underlying the PST construct. Our first two studies demonstrate that consumers have diverse understandings of sustainability.

The collective consumer population exhibits a relatively comprehensive understanding of brand sustainability and distinguishes between different aspects with varying importance. We approached the concept in a rather comprehensive way without focusing on specific industries or aspects of sustainability that might bias consumer responses. In this regard, our findings provide a new and holistic perspective on consumers' understanding of brand sustainability.

In addition, our findings show that diverse aspects relate to sustainability communication—that is, transparency, authenticity, and credibility. The importance of these aspects indicates the need for a conceptualization of PST that encompasses more than just the three traditional pillars of sustainability (Crittenden et al., 2011). Thus, we contribute to a broad, consumer-centric definition of brand sustainability that goes beyond the three-pillar definition (Elkington, 1997; Shultz et al., 2022).

Second, our work underscores the importance of PST as a key mediating construct that needs to be considered when explaining sustainable consumer behavior. Prior research has theoretically discussed that the bottom-up sustainability perception of consumers may deviate from objective indicators and should therefore be considered (Kapitan et al., 2019; Peloza et al., 2012). We link to this and provide a methodological framework and empirical evidence for the importance of PST in shaping consumers' preferences and choices. Our results show that sustainable brands elicit more favorable attitudes and evaluations as well as more positive behavior toward a brand due to higher PST. Highlighting the importance of PST can serve as an impulse to integrate the concept in different areas of sustainability research, such as sustainability communication or in studies on the attitude–behavior gap.

Third, we provide a measurement tool to promote research on the impact of PST. Compared to the previously developed measurements based on the top-down definition of sustainability (e.g., Baalbaki & Guzmán, 2016; Carter et al., 2021; Walsh & Beatty, 2007) our scale points to a variety of consumer-relevant aspects and incorporates them in a measure. Measurement scales that start from a top-down definition, for example, do not include items on how sustainability is communicated or the perceived authenticity, transparency and credibility with which a brand implements its sustainability efforts. Our scale provides added value by including these aspects, which have also been shown to be markedly important to consumers according to findings from literature on green skepticism (e.g., Chen, 2010; Leonidou & Skarmeas, 2017).

Another advantage of the developed PST scale is its validation in different countries and across product categories. Research on sustainable products shows that on a product-level

very different aspects are relevant for various product categories (Luchs et al., 2010). The added value of the scale lies in its brand-level approach, making it universally applicable in different sectors such as fast-moving consumer goods, durables, fashion, and electronics and in different geographical regions. An examination of invariance in the multigroup analyses has shown that the scale is not sensitive to specific sectors or brands.

Lastly, PST is well suited for investigating more complex issues in the area of sustainable consumer behavior. As disciplines evolve, research questions become more complex and multi-layered. For example, the question of the degree of sustainability becomes more important. So far, a binary distinction between sustainable versus conventional options has often been made (e.g., Carter et al., 2021; Gershoff & Frels, 2015). In this respect, a detailed PST measure encompassing various aspects of brand sustainability is valuable. The scale includes different aspects of brand sustainability and can thus more precisely differentiate the degree of sustainability. As a consequence, the anticipated sensitivity of this scale is expected to be higher (compared to other less detailed existing measures) when differentiating between greenwashing and genuine sustainability efforts.

Additionally, the PST scale measures assesses a construct as it is subject to situational modification (e.g., via effective sustainability communication or consumer education). As situational factors can activate different levels of PST, this construct represents an adjustable parameter which is of high managerial relevance and the scale enhances the progression of research into fostering sustainable behavior.

2.4.2 Managerial implications

From a practical standpoint, successfully implementing sustainability involves identifying and addressing the relevant sustainability issues on an operational level in accordance with the stakeholders' (including consumers') understanding of sustainability issues and benefits (Crittenden et al., 2011). This involves optimizing marketing and communication strategies to align consumer perceptions with the actual sustainability efforts of a brand (Kapitan et al., 2019; Peloza et al., 2012). Market research shows that for brands there is a lot of financial and reputational potential in sustainability efforts (Brand Finance, 2023). However, only as long as there is a match between actual and perceived brand sustainability (Kapitan et al., 2019).

In reality, we repeatedly see problems arise when this is not the case. For example, *Walmart* started an ambitious sustainability initiative in the early 2000s (Institute for Local Self-Reliance, 2017). Despite implementing concrete actions to foster the sustainability of its

business practices, the company was not perceived as sustainable by consumers. In the long term, these efforts were scaled back, partially driven by a lack of consumer interest and reward. In this regard, we provide valuable insights for brands that already implement sustainable practices and want to boost their sustainability reputation.

We also provide insights into consumer-relevant aspects that can help in managing the perceptual level and reconciling it with the operational level. Notably, the work also demonstrates the importance of driving both dimensions for sustainable brand development: communicative efforts can only be successful if actual efforts are implemented holistically, authentically, and transparently (Kapitan et al., 2019).

Additionally, we demonstrate two applicable research methods on which practitioners can rely. First, we demonstrate the usefulness of automated text analysis for capturing complex constructs from a consumer perspective (Berger et al., 2020). Brand managers can adapt the methodology of Study 1a based on their own customer base to capture their consumers' expectations with respect to brand sustainability but also other abstract, intangible constructs. Second, we provide a nuanced scale to measure the perceptual dimension in practical applications. This provides a convenient way of capturing PST, as the scale can be easily added to any customer satisfaction survey.

Apart from that, our work offers some guidance for policymakers. Our findings provide an overview of what consumers collectively consider important (although individual consumers may potentially be unaware of specific aspects). Coupled with expert knowledge of (brand) sustainability, objective and subjective viewpoints can be contrasted to develop guidelines and awareness campaigns. These can show consumers what is objectively important for sustainable brands and can empower them in their ability to better recognize truly sustainable initiatives and assess the brands' sustainable practices as objectively as possible.

2.4.3 Limitations and avenues for future research

Like any other research endeavor, this study is not without its limitations, which in turn indicate potential areas for future research.

With regard to the external validity of the scale, this is an advantage showing reliability across samples and populations. However, gaining more consumer insights and testing the PST scale in other cultural contexts (e.g., in developing countries) can be an interesting area for future research. Although, we collected data from different countries, we did not specifically investigate cross-cultural differences. Such an extension would also be helpful in investigating cross-cultural differences in PST (Pisano & Lubell, 2017). Given that brands and their

personality, as well as the challenge of sustainable development are seen and approached differently in different cultures, more research on the potentially varying consequences of PST is needed (Pisano & Lubell, 2017).

As indicated above, another valuable avenue is the investigation of the diverse antecedents of PST, especially in the context of sustainability marketing and communication. For example, future research could examine how PST is impacted by specific sustainability efforts or communication materials (White et al., 2019). Finally, is would be interesting to extend the stakeholder-based view of sustainability to other groups such as employees, investors or suppliers (Kapitan et al., 2019).

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3. Experimental insights into the impact of holistic sustainability signaling on consumers

Abstract

Communicating product sustainability creates a high-noise environment with complex information. Such sustainability signals and their effect on consumers have been studied in isolation. In reality, however, companies usually do not send single sustainability signals, but signal portfolios (i.e., sets of several signals). These portfolios can vary in how holistically they cover different sustainability-related attributes of the product. While research shows that holistic approaches to sustainability have the greatest positive sustainability impact, it remains unclear whether consumers recognize and value signal portfolios that reflect such approaches. Across three studies (N_{total} = 854) in Germany and the US, we find consumers perceive holistic signal portfolios about a pair of jeans more sustainable than selective portfolios. This positively affects purchase-relevant variables. Our research contributes by conceptualizing holistic sustainability signals and testing their effects on consumer responses. For practitioners, we offer insights into why holistic approaches and education about holistic sustainability can be worthwhile.

Keywords: holistic sustainability, consumer perception, signaling theory, signal portfolio

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Current status of the paper: This paper is currently under review. An earlier version of the paper has been presented at the *International Conference of Research in Advertising (ICORIA)* 2021 in Prague and at a paper development workshop of the International Journal of Research in Marketing 2022, online. It also has been accepted at the *Annual Meeting of the Academy of Management (AOM)* 2023 in Boston. An abstract is published as: Fella, S., Burkert, M., Hahn, R., & Hüttl-Maack V. (2023). The more, the better? Sustainability-related signals and consumers' perception. *Academy of Management Proceedings,* 13084. https://doi.org/10.5465/AMPROC.2023.13084abstract. The formatting of this paper has been adjusted to fit the formatting of this dissertation

3.1 Introduction

In response to rising consumer interest in sustainability, many companies increasingly try to convey positive social and/or environmental attributes of their products (Rathee & Milfeld, 2023; Steenis et al., 2023). The range of possible sustainability-related product attributes is broad and extends, for example, from reducing the use of hazardous chemicals in the extraction of raw materials, guaranteeing human rights and avoiding child labor on production sites to ensuring a circular economy at the end of a product's life-cycle (Marcon et al., 2022). The resulting proliferation of complex and sometimes even misleading product sustainability information has created a high-noise environment which challenges both consumers and companies (Janssen et al., 2022; Steigenberger & Wilhelm, 2018).

The literature on corporate sustainability management suggests that holistic sustainability approaches that implement social and environmental sustainability along the entire value chain generate the greatest positive sustainability impact (Kapitan et al., 2019; Nikolaou & Tsalis, 2018; Petersen & Brockhaus, 2017). As these holistic approaches often entail high financial costs (Gao & Bansal, 2013), companies need consumers to recognize and reward their holistic approaches to be able to implement sustainability efforts in the long-term (Kapitan et al., 2019). However, with respect to the true contribution to sustainability, there is an information asymmetry in the sense that consumers cannot really observe which efforts companies undertake and which impacts they generate (Atkinson & Rosenthal, 2014). Hence, companies need to send effective sustainability signals to consumers to be perceived as sustainable (Carter et al., 2021). Consumers must select and interpret the potentially vast information which makes it difficult for genuinely sustainable companies to effectively reach consumers with their sustainability communication (Connelly, Ketchen, & Slater, 2011).

While extensive research has been conducted on the impact of individual sustainability claims or messages (Rathee & Milfeld, 2023), there is little evidence on the impact of communicating holistic sustainability approaches on consumers. Therefore, it is largely unclear whether signaling holistic product sustainability has the potential to reach and convince consumers in a high-noise environment (Steigenberger & Wilhelm, 2018). Thus, the current work is guided by the following research questions: How does holistic sustainability signaling affect consumers' sustainability perception and which consequences will this have for purchase-relevant variables?

To answer these questions, we follow a multi-stage, integrative research approach: We first conducted a factorial survey experiment (FSE) to investigate the influence of a varying number of sustainability signals on consumers' sustainability perception. To verify and validate

the results of the FSE with more realistic stimuli in a different cultural context, and to test the role of sustainability perception in driving purchase-relevant variables, we then conducted two between-subjects experiments. Overall, the results show a positive effect of holistic sustainability signaling on sustainability perception and an indirect effect on other consumption-relevant variables such as purchase intention, product evaluation, and a behavioral proxy.

This research contributes to the literature by conceptualizing holistic sustainability signaling and testing its effect on consumers' perception and responses. We identify holistic sustainability signaling as an effective communication approach. Additionally, we connect to so far under-researched facets of signaling theory (i.e., signal portfolios and consumers' perceptions thereof), thereby generating insights into the receiver's perspective on sustainability signals and the joint effect of multiple signals to communicate holistic sustainability. From a practical perspective, our research provides guidance in corporate sustainability decision-making by revealing that signaling approaches that reflect holistic sustainability can be rewarding. Therefore, additional education about holistic sustainability holds potential to further enhance sustainable consumption choices.

3.2 Signaling theory in the context of holistic sustainability communication

Nowadays, many signals about a product's sustainability are available. Such sustainability information represents a credence attribute that cannot solely be verified by personal experience (Atkinson & Rosenthal, 2014). Instead, consumers as signal receivers can evaluate product sustainability almost exclusively on the basis of information provided by companies as signal senders.

According to signaling theory (Spence, 1973), an information deficit of the signal receiver regarding unobservable product attributes leads to a situation in which consumers can only assess products and services based on imperfect (e.g., incomplete or even misleading) signals sent by companies (Connelly, Certo, et al., 2011). The market for sustainable products can thus be regarded as an asymmetric information environment, as it is difficult for actors outside the company to receive credible information about product sustainability (Atkinson & Rosenthal, 2014).

A signal can be defined as "a marketer-controlled, easy-to-acquire informational cue […] that consumers use to form inferences about the quality or value of that product" (Bloom & Reve, 1990, p. 59). Accordingly, a sustainability signal represents an information piece about

sustainability-related attributes of the product[2] sent by the company, which consumers can use to form their perception of the product's sustainability.

Companies often implement a multiple signal approach to communicate the complex topic of sustainability (Connelly, Certo, et al., 2011). In holistic sustainability approaches, companies consider all three domains of the Triple Bottom Line (environmental, social, and economic sustainability; Nikolaou & Tsalis, 2018) throughout a product's entire life-cycle (Marcon et al., 2022; Petersen & Brockhaus, 2017). Thus, consumers are often confronted with whole signal portfolios (i.e., sets of various, simultaneously communicated sustainability signals; Zerbini, 2017). In line with this, we define a holistic sustainability signal portfolio based on sustainability domains and life-cycle phases. Building on the work of Vieira et al. (2023), we suggest that signal portfolios can either include information on a specific sustainability domain and life-cycle phase, which we refer to as *selective* signal portfolio, or to multiple sustainability domains and life-cycle phases, which we term *holistic*.

In addition, external factors, such as cause-related marketing (CM; a marketing strategy based on the support of social causes), are often communicated to signal a company's sustainability engagement (Barone et al., 2000). CM is not necessarily part of a holistic sustainable signal portfolio, but can be seen as an additional component.

Signaling theory provides multiple theoretical arguments explaining why holistic signal portfolios are expected to have a more positive impact on consumers' sustainability perception than selective portfolios. First, costly signals are a key element in signaling theory (Connelly, Certo, et al., 2011; Connelly, Ketchen, & Slater, 2011). For receivers, a signal transmits credence if it is costly to implement for the sender (Connelly, Certo, et al., 2011; Spence, 1973). Holistic signal portfolios contain information on a set of sustainability efforts which can be expected to be more costly to implement than a few isolated initiatives (Hahn et al., 2021; Kapitan et al., 2019). Accordingly, signal portfolios should have a more positive effect on consumers' sustainability perception than selective signal portfolios. Notably, most consumers are not sustainability experts and thus cannot estimate the true costs behind a specific sustainability portfolio. While most consumers are not sustainability experts and thus cannot estimate the true costs behind a specific sustainability portfolio, we assume that they expect comprehensive measures to incur greater expenses compared to singular initiatives. This leads consumers to perceive a holistic signal portfolio as indicative of substantial financial commitment to product sustainability (Connelly, Ketchen, & Slater, 2011).

[2] This includes direct components of the product but also process-related and supplementary aspects, which are not necessarily visible in the final product.

Second, we include the concept of valuable signals which extends the idea of costly signals. Hahn et al. (2021) posit that valuable signals transmit information not only through their costliness. Instead, the information itself carries meaning for the receiver in the sense that valuable signals include the perceived appropriateness of a signal as non-economic element. Signal receivers derive the appropriateness of a signal mainly through psychological arguments. They weigh up the signals' content to determine the value of a signal, which is why this process is shaped by the receiver's perspective.

Consumers as signal receivers understand that sustainability encompasses a variety of relevant aspects (Luchs & Miller, 2015) and prior research shows that consumers exhibit a particularly positive response to products that are holistically sustainable, as opposed to products featuring only single sustainable attributes (Steenis et al., 2023). Therefore, from a consumer perspective, a holistic signal portfolio ought to be more effective in conveying the complex nature of (product) sustainability. It provides a more compelling case by supporting diverse sustainability attributes indicating that the product offers a vast range of sustainability benefits and thus strengthening the impression of a genuinely sustainable product (Carter et al., 2021; Nikolaou & Tsalis, 2018).

Based on the concept of costly as well as valuable signals, we therefore hypothesize:

H1 *Holistic sustainability signal portfolios influence consumers' product sustainability perception more positively compared to selective sustainability signal portfolios.*

Individual perceptions influence how consumers think and behave (Mothersbaugh et al., 2020). Sustainability perception is thus an important mediator between sustainability communication and purchase-relevant consumer responses (Steenis et al., 2023). This makes sustainability perception managerially relevant for companies, as it can be influenced, for example, by providing information or by engaging in consumer education.

Many consumers nowadays feel positive about products and behaviors that foster sustainability (Park & Lin, 2020). Holding other product characteristics, such as quality, constant, product sustainability is thus regarded as an incremental benefit by most consumers (Sigurdsson et al., 2023). If consumers' sustainability perception increases through effective sustainability signaling, this should, in turn, have a positive effect on variables more closely related to the purchase decision. We therefore hypothesize:

H2 *Holistic sustainability signal portfolios increase consumers' product sustainability perception, which has a positive influence on (a) purchase intention, (b) product evaluation, (c) intention to engage in positive word-of-mouth, (d) relative willingness-to-pay, and (e) a behavioral proxy.*

Finally, the effectiveness of a specific signal portfolio also partly depends on individual receiver characteristics (Connelly, Certo, et al., 2011), that is, their individual attitudes and values determine how information is processed (Sigurdsson et al., 2023). In the context of sustainable consumer behavior, biospheric (i.e., valuation of the environment) and altruistic (i.e., valuation of the well-being of others) value orientations are among the most relevant individual characteristics (Bouman et al., 2018). They represent stable guiding principles in the lives of people who (unconsciously) align their thoughts and decisions with them (Bouman et al., 2018). Although not in the main focus of the paper, these values are integrated into our empirical approach as they have been found to influence consumers' (sustainability) perceptions (Mothersbaugh et al., 2020).

3.3 Study 1

3.3.1 Procedure

The aim of this study was to investigate the influence of a varying number of sustainability signals and the degree of holistic signaling on consumers' product sustainability perception. Signal portfolios and the high-noise environment with many simultaneously occurring sustainability signals represent a complex reality that needs to be reflected in the research approach. To map this, we applied an experimental vignette study in the form of an FSE.

FSEs aim to approximate complex, multidimensional attitudes and perceptions (Hainmueller et al., 2015; Oll et al., 2018). Vignettes are the central component of FSEs and represent descriptions of a hypothetical object, person, or situation. The descriptions experimentally vary with regard to multiple dimensions with different levels (Auspurg & Hinz, 2015). By including a wide range of different dimensions, complex information environments or judgment situations can be captured (Oll et al., 2018). It is common for each participant to evaluate several vignettes.

Additionally, FSEs offer the opportunity to include respondent-specific characteristics to investigate their interactions with the vignette dimensions (Atzmüller & Steiner, 2010). Thus,

by combining elements of experimental and survey research, FSEs are well-suited to deal with the interplay of different factors as in a multidimensional topic such as sustainability perception (Oll et al., 2018).

In our case, each vignette represented a signal portfolio that consisted of different sustainability signals relating to a pair of jeans. The number and composition of the individual signals determined the degree to which the signal portfolio was holistically sustainable. Holistic product sustainability was defined as encompassing as many distinct sustainability domains and product life-cycle phases as possible (Kapitan et al., 2019; Nikolaou & Tsalis, 2018).

Therefore, we systematically varied the dimensions (a) environmental sustainability addressed (yes, no), (b) social sustainability addressed (yes, no), (c) number of life-cycle phases addressed (none, one, two, or three phases), and (d) cause-related marketing addressed (yes, no).

Whereas all three domains of the Triple Bottom Line are relevant to a holistic sustainability approach, economic sustainability is primarily considered as a managerial concern. Consumers are increasingly confronted with information on the environmental and social sustainability of products (Eisingerich et al., 2023), which we therefore included as sustainability domains in our research design. A more holistic vignette included information on both environmental and social sustainability, while a less holistic vignette only described one sustainability domain.

In terms of life-cycle phases, we adhered to prior research and identified three levels based on key phases that are relevant for consumers, and at the same time, can be actively shaped by companies: the sourcing of raw materials, production processes, and the end-of-life phase, including recycling or disposal (Luchs & Miller, 2015; Petersen & Brockhaus, 2017). Based on our definition of holistic sustainability, a signal portfolio is more holistic the more life-cycle phases are covered.

Last, we complemented our design with CM as strategy to achieve marketing objectives through the support of social causes (Barone et al., 2000). This enables us to map a holistic approach that covers many aspects even beyond product-inherent attributes. To operationalize CM, we included signals on a frequently covered form of CM: for each purchase of a company's products or services, the company supports a designated social cause (Tucker et al., 2012).

All dimensions and levels combined yielded a 2 (environmental sustainability addressed: yes, no) × 2 (social sustainability addressed: yes, no) × 4 (number of life-cycle phases addressed: none, one, two, three) × 2 (CM: yes, no) design. The resulting vignette universe consisted of 2 × 2 × 4 × 2 = 32 combinations which were each represented by one

vignette. After eliminating illogical combinations from the vignette universe[3] a total of 21 vignettes remained. Table 3-1 displays two exemplary vignettes.

	Vignette example 1 (selective)		**Vignette example 2 (holistic)**	
	Environmental aspects	**Social aspects**	**Environmental aspects**	**Social aspects**
Sourcing	The organic sourcing of cotton complies with the highest environmental standards.	*No information available.*	The organic cultivation of cotton complies with the highest environmental standards.	The small farmers receive a fair wage for growing the cotton.
Production	*No information available.*	*No information available.*	The production is with 100% renewable energy.	Production creates well-paid jobs in emerging and developing countries.
End-of-life	*No information available.*	*No information available.*	The materials are fully degradable at the end of their life and can be composted.	When returned via the retailer, the refurbishment of the used jeans creates jobs in social institutions.
Donation	For every purchase of these jeans a donation is made to an environmental project.	*No information available.*	For every purchase of these jeans a donation is made to an environmental project.	For every purchase of these jeans a donation is made to a social project.

Table 3-1. Two exemplary vignettes (Study 1).

Per definition, the non-holistic signal portfolios did not include signals on all life-cycle phases. Therefore, we tripled the design. Specifically, we multiplied vignettes that did not cover all life-cycle phases to vary which specific life-cycle phase was described. For example, if the portfolio only included signals on one life-cycle phase, this portfolio existed three times within our vignette universe, describing either sourcing, production, or end-of-life. This way, we ensured that choosing a particular life-cycle phase did not have an uncontrolled influence. To compensate for any confounding effects of text length, we opted for a tabular format to present

[3] Illogical combinations occurred, for example, in cases where the number of life-cycle phases addressed was "none" and no CM existed. In such a case, it would not have been possible to report on environmental or social sustainability issues at all. For example, a combination of "number of life-cycle phases addressed: none" with "environmental sustainability addressed: yes" was not possible and thus excluded from the vignette universe.

the sustainability information, including a statement that no information was available where the combination of dimensions and levels made it necessary.

We divided the 63 vignettes into nine sets (Aguinis & Bradley, 2014). Each participant was randomly allocated to separately rate seven vignettes, which is well below the recommended maximum of 20 (Auspurg & Hinz, 2015). Within a vignette set, the vignette order was randomized to prevent order effects. To avoid confounding effects due to the specific composition of the vignette sets, we chose a d efficient blocking procedure[4] (Atzmüller & Steiner, 2010; Auspurg & Hinz, 2015). When determining the necessary sample size, we opted for a conservative approach with each vignette being rated at least 15 times, requiring a minimum sample of 135 participants (Aguinis & Bradley, 2014).

To test H1, we recruited German consumers from a consumer access panel provider. In a global comparison (N = 10,281), German consumers exhibited a moderate stance regarding the importance and the role of sustainability in the context of consumption (Global Sustainability Study 2021). Therefore, no influences based on specific German circumstances in relation to sustainability are expected.

To maintain high data quality standards, we implemented two attention checks (in addition to the safeguards installed by the panel provider; e.g., Captcha solutions to avoid fake answers from bots, or compliance with ESOMAR standards). Within multi-item grids, we placed an item instructing the participants to select a specific scale option (e.g., “completely disagree”). Participants who failed to choose this option were screened out and not allowed to finish the survey.

The final sample of 251 consumers (M_{age}= 47.70, SD = 16.53; 50.6% female, education: 21.1% low (International Standard Classification of Education (ISCED) 0-2), 51.8% middle (ISCED 3-4), 27.1% high (ISCED 5-8) was representative for the German population in terms of gender, age, and education. After providing informed consent and demographic data, participants saw the seven vignettes and rated each on the dependent variable product sustainability perception ("How sustainable do you perceive this product?", Gershoff & Frels, 2015). This variable was measured on an 11-point scale which is recommended to allow for linear modeling (Oll et al., 2018). This procedure resulted in 1,757 vignette ratings.

After this experimental part, we included questions on respondent-specific characteristics relating to sustainable consumer behavior (i.e., biospheric and altruistic value orientations) in the survey part. Appendix B provides an overview of all measures.

[4] Search algorithms for d-efficient designs try to find an optimal efficient solution between perfect balance and orthogonality.

3.3.2 Results

We used a multilevel regression approach, which is recommended when outcomes are not independent (i.e., multiple ratings by one participant; Heck et al., 2014). We followed recommendations for mixed models and applied grand mean centering for the dependent and metric control variables (Heck et al., 2014). We specified an unconstrained baseline model including the dependent variable and random intercepts for each participant. This showed an intraclass correlation coefficient of 17.2%, justifying multilevel analysis (Heck et al., 2014). Following a stepwise approach, we extended the baseline model (see Table 3-2): First, we estimated Model 1 including only the vignette dimensions depicting different sustainability signals (level 1). Second, we added respondent-specific characteristics (level 2), individual-level controls, and (cross-level) interactions, yielding Model 2.

	Model 1			Model 2		
	Beta	***SE***	***t***	***Beta***	***SE***	***t***
Vignette dimensions (L1)						
Environmental sustainability domain (env)						
No (ref.)						
Yes	2.23***	.11	20.18	1.20***	.20	5.93
Social sustainability domain (soc)						
No (ref.)						
Yes	1.20***	.11	10.81	.15	.18	.79
Life-cycle phase (LCP)						
No phase (ref.)						
One phase	1.74***	.15	11.27	1.68***	.22	7.80
Two phases	3.28***	.15	21.34	3.12***	.26	11.94
Three phases	4.50***	.15	29.41	4.20***	.32	13.12
Cause-related marketing (CM)						
No (ref.)						
Yes	.70***	.10	7.18	.89***	.25	3.62
Respondent-specific characteristics (L2)						
Biospheric values (bio)				-.14	.12	-1.14
Altruistic values (altr)				-.03	.14	-.19
(Cross-level) interactions						
LCP × env ×sust				.62***	.09	6.80
LCP × CM				-.11	.11	-.99
Env × bio				.26*	.10	2.58
Soc × altr				.19*	.09	2.00
Controls						
Sex (Male, ref.)				.01	.21	.06
Age				-.01	.01	-1.20
-2LL	6699.62			7445.95		
Covariance Structure	VC			UN		
N (participants)	251			251		
N (vignette ratings)	1,757			1,757		

Note: unstandardized coefficients; method: restricted maximum likelihood; controlled for vignette set effects; * p < .05; ** p < .01; *** p < .001.

Table 3-2. Results (Study 1).

The results showed significant main effects of all four dimensions on product sustainability perception (Model 1). If environmental sustainability signals were presented, this increased consumers' sustainability perceptions by 2.23 scale points, whereas the presentation of social sustainability signals increased the dependent variable by 1.20 scale points ($\beta_{env} = 2.23$, $p < .001$; $\beta_{soc} = 1.20$, $p < .001$). Furthermore, sustainability information referring to multiple phases (e.g., sustainable sourcing, production, and end-of-life versus only sustainable sourcing), had a positive influence on sustainability perception. The more signals on different life-cycle phases were available, the more positive this effect was ($\beta_{1phase} = 1.74$, $p < .001$; $\beta_{2phases} = 3.28$, $p < .001$; $\beta_{3phases} = 4.50$, $p < .001$). Finally, the presence of information on CM also showed a positive effect on perceived sustainability ($\beta_{CRM} = 0.70$, $p < .001$).

Model 1 therefore indicated a positive effect of holistic sustainability portfolios (in terms of positive main effects due to covering several life-cycle phases). However, an investigation of interactions provided deeper insights considering all life-cycle phases and both sustainability domains as relevant factors for a holistic sustainability approach.

In Model 2, we found a significant three-way interaction between life-cycle phases, environmental, and social sustainability signals ($\beta_{LCP \times env \times soc} = 0.62$, $p < .001$). Thus, presenting a signal portfolio covering not only more life-cycle phases but also both sustainability domains had a positive effect on sustainability perception. However, the two-way interaction between life-cycle phases and CM was not significant ($\beta_{LCP \times CM} = -0.11$, $p > .05$). This indicates that if a product is perceived as inherently sustainable, information on CM does not additionally contribute to sustainability perception.

When including respondent characteristics and cross-level interactions in Model 2, the influence of social sustainability signals becomes insignificant ($\beta_{soc} = 0.15$, $p > .05$). However, we found a significant cross-level interaction between altruistic value orientations and the social sustainability domain ($\beta_{soc \times alt} = 0.19$, $p < .05$). The same was present for biospheric value orientations and environmental sustainability signals ($\beta_{env \times bio} = 0.26$, $p < .05$). This indicates that consumers react more positively to sustainability signals that closely correspond to their value orientations. Neither biospheric nor altruistic value orientation had a significant direct effect on perceived sustainability ($\beta_{bio} = -0.14$, $p > .05$; $\beta_{alt} = -0.03$, $p > .05$).

In sum, Study 1 altered the absolute number of signals within a signal portfolio and showed that providing more sustainability signals increases consumers' sustainability perception. The findings align with hypothesis H1, which anticipates a favorable impact of holistic sustainability information on perceptions of sustainability.

This positive impact of holistic portfolios is potentially due to the fact that an increased number of signals allowed consumers to receive a holistic impression of sustainability along the entire product life-cycle (Steigenberger & Wilhelm, 2018; Zerbini, 2017). Similarly, adding both environmentally and socially sustainable information had a significant positive effect. Notably, the non-significant effect of adding CM to a signal portfolio covering several sustainability domains and life-cycle phases supports the idea that, compared to several product-inherent sustainability signals, the addition of merely a symbolic sustainability signal might be ineffective (Hahn et al., 2021). This indicates that not only the number of sustainability signals increases sustainability perception, but that the inclusion of various product-inherent sustainability attributes drives the positive effect. Finally, signals that match consumers' value orientations lead to a higher sustainability perception.

3.4 Study 2a

Study 1 suggests that more holistic portfolios lead to a higher sustainability perception compared to those that only cover sustainability to some degree; however, the study design leaves several questions unanswered. It did not allow us to conclusively determine whether this effect was indeed due to the fact that consumers recognized that signal portfolios holistically covered several sustainability domains and life-cycle phases or whether they merely used the number of signals as a heuristic.

In Study 1, we opted for the presentation of the signal portfolios in a table to avoid varying text lengths as confounders. This presentation format, however, strongly emphasized the absence of some signals in non-holistic portfolios which could potentially have led to a heuristic in the sense of "the more information available, the better." Therefore, we complemented our empirical inquiry with an experimental between-subjects design in Study 2a to bundle the dimensions and levels of the FSE and manipulate the degree to which a signal portfolio is holistic as a single experimental factor.

In addition, FSEs are very well suited to depicting complex scenarios to measure perceptions and attitudes. However, the literature on sustainable consumer behavior shows that attitudes often do not translate into purchasing behavior (attitude-behavior gap; Park & Lin, 2020). Since the (sustainability) perception theoretically shapes further purchasing and consumption behavior (Mothersbaugh et al., 2020), we also investigate in Study 2a whether the increased sustainability perception due to a holistic signal portfolio subsequently affects purchase-relevant variables (i.e., purchase intention, product evaluation, positive word-of-mouth (WOM) intention, relative willingness-to-pay (WTP), and a behavioral proxy).

3.4.1 Procedure

The aim of Study 2a was to isolate the effects of holistic sustainability signaling on sustainability perception and investigate its impact on purchase-relevant variables. To rule out that the mere number of signals served as a heuristic, we held the number of signals constant across all experimental groups. The presented signal portfolio only varied in the number of sustainability domains and life-cycle phases addressed (i.e., both environmental and social sustainability domains and all life-cycle phases addressed vs. only one sustainability domain and one life-cycle phase addressed). We also incorporated a more realistic presentation of the sustainability information in the form of a product label on a pair of jeans.

We implemented a three cell (sustainability approach: holistic vs. selective environmental vs. selective social) experimental between-subjects design. Across all three experimental groups, participants saw information on the addressed sustainability domains and life-cycle phases. Additionally, they saw six bullet points including specific sustainability information (e.g., "made from 100% recyclable materials," or "fair working conditions").

In the holistic condition, an approach addressing both sustainability domains and all life-cycle phases was described. Six bullet points, one environmental and one social for each of the three life-cycle phases, were displayed. In the non-holistic conditions, the labels described that one life-cycle phase (i.e., production) was designed either environmentally sustainable or socially responsible. The six bullet points referred to either environmental or social aspects of one specific life-cycle phase. As a result, product sustainability was described more selectively (only in relation to one sustainability domain and one life-cycle phase) while the number of bullet points remained the same.

We recruited 303 German consumers (M_{age}= 30.64, 48.8% female) for an online survey on Prolific. The participants were randomly assigned to one of the three conditions ($n_{holistic}$= 103, n_{env} = 99, n_{soc} = 101). We implemented the same attention checks as in Study 1. After providing informed consent and their demographic data, participants were asked to imagine that they were looking for a pair of jeans and had found one that fitted them. Next, participants saw the label with the sustainability information and responded to various attitude- and purchase-relevant items.

The participants indicated their purchase intention (Schroll et al., 2018), product evaluation (Schroll et al., 2018), and intention to engage in positive WOM (Price & Arnould, 1999) on seven-point scales. Additionally, they provided information on their relative willingness-to-pay on a seven-point scale ranging from 70€ to 190€. We used the same item as in Study 1 to measure product sustainability perception (Gershoff & Frels, 2015).

To additionally examine the impact of sustainability perception on a behavioral proxy, we asked participants whether they would like to receive more information about the presented jeans before finishing the survey (e.g., where the jeans can be purchased). Participants could opt in or out and were explicitly informed that this was a voluntary option. This choice of receiving and reading additional information (paid with the participants' time) is a behavioral consequence and demonstrates a higher level of interest and willingness to engage with the product (which is a better proxy for purchases than the mere intent; Hulland & Houston, 2021).

Afterwards, a manipulation check recorded the extent to which participants perceived the sustainability of the jeans as holistic (or selective; see Appendix B).

3.4.2 Results

The manipulation worked as intended and the signal portfolio was perceived as more holistically sustainable in the holistic condition compared to both non-holistic conditions ($M_{holistic}$ = 5.76, M_{env} = 3.13, M_{soc} = 3.13, F = 124.34, p < .001; Post-hoc Scheffé tests showed a significant difference between the holistic and both other conditions with p < .001). A comparison of the mean values for product sustainability perception showed a statistically significant higher product sustainability perception for the holistic condition compared to both other conditions ($M_{holistic}$ = 6.15, M_{env} = 5.39, M_{soc} = 5.08, F = 19.67, p < .001; Post-hoc Scheffé tests with p < .001). The results are thus consistent with H1, predicting the positive effect of holistic sustainability information on sustainability perception. Descriptively, and in line with Study 1, the results showed a higher sustainability perception for the selective environmental information than for the social information, albeit this difference was not significant (p = .21).

In H2, we additionally hypothesized a positive indirect effect of holistic sustainability information on several purchase-relevant dependent variables via increased sustainability perception. Mediation models (PROCESS bootstrapping macro, model 4)[5] revealed a significant indirect effect of sustainability perception on purchase intention (IE = .52, SE = .11, $CI_{95\%}$[.32, .75]), product evaluation (IE = .50, SE = .09, $CI_{95\%}$[.33, .70]), positive WOM intention (IE = .52, SE = .10, $CI_{95\%}$[.34, .73]), and relative WTP (IE = .12, SE = .04, $CI_{95\%}$[.05, .20]). The indirect effect on the behavioral proxy was not significant (IE = .13, SE = .10, $CI_{95\%}$[-.04, .36]).

[5] We additionally measured environmental knowledge . The effects of all models remained stable when environmental knowledge was included as covariate.

3.5 Study 2b

3.5.1 Procedure

To further generalize our findings, we validated and replicated our approach with US consumers and recruited a total of 300 respondents (M_{age} = 38.30, 49.0% female) to complete an online survey on Prolific. We used the identical stimulus material, study design, and procedure as in Study 2a ($n_{holistic}$ = 99, n_{env} = 99, n_{soc} = 102).

3.5.2 Results

The manipulation worked as intended ($M_{holistic}$ = 5.61, M_{env} = 3.33, M_{soc} = 3.87, F = 59.71, p < .001; Post-hoc Scheffé tests showed a significant difference between the holistic and both other conditions with p < .001). We again compared the mean values for product sustainability perception. In line with H1, we identified higher product sustainability perception for the holistic condition compared to the others ($M_{holistic}$ = 6.16, M_{env} = 5.67, M_{soc} = 5.30, F = 11.72, p < .001; Post-hoc Scheffé tests showed a significant difference between the holistic and both other conditions with p = .023 and p < .001). The mean for sustainability perception in the selective environmental information condition was again slightly higher than for the social one, however, the difference did not reach significance (p = .13).

Regarding H2, mediation models (PROCESS bootstrapping macro, model 4)[6] revealed indirect effects of sustainability perception on purchase intention (IE = .38, SE = .08, $CI_{95\%}$[.11, .54]), product evaluation (IE = .35, SE = .08, $CI_{95\%}$[.21, .51]), WOM intention (IE = .44, SE = .09, $CI_{95\%}$[.27, .62]), relative WTP (IE = .08, SE = .04, $CI_{95\%}$[.02, .17]), and the behavioral proxy (IE = .17, SE = .11, $CI_{95\%}$[.01, .43]).

3.6 General Discussion

3.6.1 Theoretical implications

Signaling theory so far has mainly focused on isolated signals, which are untypical in high-noise environments, as the market for sustainable products (Connelly, Ketchen, & Slater, 2011). We enrich signaling theory by investigating signal portfolios which better map the complex reality of sustainability communication (Connelly, Ketchen, & Slater, 2011; Zerbini, 2017). We conceptualized holistic sustainability signal portfolios and tested their effects on consumers' product sustainability perception. Our approach showed that consumers recognize

[6] The effects of all models remained stable when environmental knowledge was included as covariate.

a product as more sustainable when its sustainable attributes cover different sustainability domains and life-cycle phases.

Hence, our findings imply that the use of multiple sustainability signals in a bundle can enhance signal effectiveness (Connelly, Certo, et al., 2011). Given that the number of signals within a portfolio (and thus, the amount of information) was held constant in Study 2a and 2b, the results do not suggest that the heuristic "the more the better" applies universally. Rather, higher effectiveness seems to only be obtained if different signals complement each other to illustrate a holistic sustainability approach (Zerbini, 2017). Holistic signal portfolios therefore lead to a larger joint effect than selective portfolios and thus seem to be useful to distinguish genuinely sustainable products from partially sustainable products (Steenis et al., 2023; Steigenberger & Wilhelm, 2018).

Additionally, we follow related calls to further expand signaling theory by integrating the signal receivers' perspective (Connelly, Ketchen, & Slater, 2011; Zerbini, 2017). Receivers' attention is theorized to depend on their individual characteristics, for example, the attention paid by particular receivers to specific information (Connelly, Certo, et al., 2011; Connelly, Ketchen, & Slater, 2011). Our results from Study 1 show that value-aligned information has a greater impact on the sustainability perception than signals that do not resonate with the values of individual receivers. This implies that consumers are likely to pay the most attention to signals that match their values (Sigurdsson et al., 2023). Thus, addressing consumers value orientations with a signal portfolio can also increase its effectiveness (Eisingerich et al., 2023).

Finally, our work goes beyond the perceptual level by investigating the effect of an increased sustainability perception on further, more purchase-relevant, variables. The positive effects of sustainability perception on purchase intention, product evaluation, WOM intention, and relative WTP, indicate that financial investments in holistic sustainability strategies and signaling can be worthwhile (Steenis et al., 2023; Vieira et al., 2023). Even though the evidence for the behavioral proxy is weaker (which is not surprising, as attitudinal variables are often more strongly influenced than behavioral variables), there is also potential for holistic sustainability signal portfolios to improve behavioral variables.

3.6.2 Practical implications

Companies are increasingly confronted with decisions on corporate sustainability (Zerbini, 2017). Our results offer practical implications to guide this process. During decision-making, managers take the cost of different sustainability measures into account to stay profitable in the long-term (Gao & Bansal, 2013). In doing so, they need to communicate their

sustainability efforts in a way that resonates with consumers and makes them perceive their products as sustainable (Steenis et al., 2023).

Typically, holistic sustainability efforts along the entire product life-cycle and with an environmental as well as social orientation incur high costs (Nikolaou & Tsalis, 2018). Our results confirm what has been suggested before: Investments into holistic sustainability can be rewarding because consumers recognize them as more sustainable which positively affects purchase-relevant variables (Vieira et al., 2023).

Given the abundance of information on sustainable products, marketers also need to consider how their signals can reach consumers in a high-noise environment (Steigenberger & Wilhelm, 2018). Genuinely sustainable companies face the additional challenge that greenwashers, who deceive consumers regarding their sustainability performance, undermine the general trust in sustainability communication (Kapitan et al., 2019). Authentically implementing a holistic sustainability signaling approach is difficult and, thus, poses a challenge for companies that may be less serious about improving corporate sustainability. Therefore, implementing holistic sustainability and communicating it through signal portfolios can help genuinely sustainable companies to stand out from greenwashers (Steenis et al., 2023). In this context, certifications and official standards could be used as additional signals to substantiate the credibility of the holistic approach (Nikolaou & Tsalis, 2018). However, our research indicates that highlighting a single, specific aspect of sustainability — a current practice with sustainability labels like “Fairtrade” for fair labor practices, or “Rainforest Alliance Certified” for the protection of natural resources— might no longer be adequate to foster a credible perception of sustainability.

Finally, our research suggests that consumer education on holistic sustainability (from both corporate and governmental actors) may be useful for promoting genuinely sustainable products and for fostering more sustainable purchase decisions. Holistically sustainable products are those that have the most positive impact on the environment and society, and thus, are most conducive to sustainable development (Nikolaou & Tsalis, 2018). We observed that consumers were already responding particularly well to the communication of holistic sustainability. If their awareness is continuously strengthened, sustainable consumption choices can potentially increase.

3.6.3 Limitations and avenues for future research

This research examined signal portfolios containing information on sustainable jeans. Even though previous research has also shown a positive effect of holistic product sustainability

in the food sector (Steenis et al., 2023) and of holistic sustainability management in various product categories (Vieira et al., 2023), insights into other product categories would be valuable to further validate the presented insights.

The same applies to the cultural contexts in which the impact of holistic sustainability portfolios was examined. While we have increased the generalizability by examining an US sample in addition to two German samples, future research can further benefit from investigating the impact of holistic sustainability on consumers from more diverse cultural backgrounds or living in less developed economies.

Furthermore, prior research has indicated that the specific wording or presentation format of sustainability information influences its impact on consumers (e.g., Janssen et al., 2022; Tucker et al., 2012). We accommodated this by using different formats (i.e., table in Study 1 and label with visual and verbal elements in Studies 2a and 2b). In addition, different verbal signals were included to minimize the effect of the specific wording of individual signals. A targeted manipulation of wording or format may nevertheless be helpful for future studies to investigate potential interactions between (non-)holistic signal portfolios and these factors.

Studies 2a and 2b aimed to validate our assumptions with more realistic stimuli. Compared to a real purchase decision, however, purchase-relevant aspects such as information on price were still excluded. In the context of sustainable consumer behavior, it has been shown that attitudes and intentions do not necessarily translate into real purchases due to various external factors (Park & Lin, 2020). Therefore, it would be beneficial to test the effect of holistic signal portfolios in a real-world setting, for example as part of a field experiment.

With regard to theoretical considerations, our results point toward a complementary effect of information on different sustainability domains and life-cycle phases. This is due to consumers recognizing the signals as holistically sustainable. We relied on corporate environmental management literature to define holistic sustainability in a top-down manner. Future research could exploratorily investigate the factors specifying a holistic signal portfolio from a bottom-up consumers' perspective. As extant research has warned that providing more signals can overload consumers (Steigenberger & Wilhelm, 2018), it is imperative to understand the conditions under which consumers perceive a sustainability signal portfolio as holistic (and not redundant).

Finally, this research applied both costly and valuable signals as concepts from signaling theory to predict the positive effect of holistic signal portfolios on consumer perception (Connelly, Certo, et al., 2011; Hahn et al., 2021). Within the scope of this study, however, it was not possible to differentiate whether the observed effects were based on higher perceived

costs and/or a higher perceived appropriateness. Future research could therefore try to scrutinize the different argumentations of signaling theory regarding costly and valuable signals in the context of sustainability communication (Connelly, Ketchen, & Slater, 2011; Hahn et al., 2021).

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4. The influence of green consumption values on how consumers form overall sustainability perceptions of food products and brands

Abstract

Recently, increasing numbers of consumers have embraced higher green consumption values and expressed environmental concern through their shopping behavior. These consumers are a promising target group for sustainable products. However, especially in the food sector, it is challenging for consumers to recognize these products because of a multitude of sustainability indicators. Therefore, it is important to understand how green consumers form their perception of product sustainability based on the information provided. This research draws on means–end chain theory and the elaboration likelihood model (ELM) to explain how green consumers form an overall product sustainability perception by considering environmental and social product sustainability benefits. To provide preliminary correlational evidence, we analyzed the survey data of 1,577 European consumers who assessed three different food products. Using structural equation modeling, we found that consumers with higher green consumption values perceive environmental and social sustainability product benefits to a greater extent than those with lower green values. Increased perceptions of environmental sustainability benefits, in turn, enhance overall product sustainability perceptions, ultimately leading to a higher perceived brand sustainability. By integrating and applying means–end chain theory along with the ELM in a green product consumption context, our study provides insight on the impact of environmental and social product sustainability benefits on consumers' product sustainability perceptions. As such, the results offer a valuable starting point for further investigation of sustainable marketing strategies and consumers' product sustainability perceptions. Additionally, our findings provide guidance to food marketers seeking to promote sustainable products.

Keywords: green consumption values, sustainability benefits, sustainability perceptions

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Current status of the paper: This paper is published as: Burkert, M., Hüttl-Maack, V., Gil, J. M., & Rahmani, D. (2023). The Influence of Green Consumption Values on How Consumers Form Overall Sustainability Perceptions of Food Products and Brands. *Journal of Sustainable Marketing, 4*(1), 44–62. https://doi.org/10.51300/JSM-2023-103
An earlier version of this paper was presented at the conference *Research Innovations in Sustainable Marketing (RISM)* 2023 online. An extended abstract is published as: Burkert, M., & Hüttl-Maack, V. (2023). Flesh out your sustainability marketing more concretely! How emphasizing sustainability benefits of food products shapes the view through green-tinted glasses. *Business Research Proceedings*, 1–2. https://doi.org/10.51300/BRP-2023-74
The formatting of this paper has been adjusted to fit the formatting of this dissertation.

4.1 Introduction

Undeniably, enhancing sustainability in the food sector is crucial, as everyday food consumption is a major contributor to emitted greenhouse gases and other environmentally harmful impacts. Global food systems are currently estimated to be responsible for up to one-third of anthropogenic greenhouse gas emissions worldwide (Crippa et al., 2021). Numerous aspects of the product life cycle of food, such as the use of land, production in the agricultural system, and further processing (e.g., transportation, packaging, retail handling, preparation and waste removal) play a role and offer starting points for designing food more sustainably (Crippa et al., 2021; Lazzarini et al., 2017).

On the consumer side, awareness has also increased and consumers have started to express their concern for the environment through their shopping behaviors (Gershoff & Frels, 2015; Haws et al., 2014; Leonidou & Skarmeas, 2017). Haws et al. (2014) captured this tendency in their research on green consumption values, which translate environmental concerns into purchasing behavior and thereby, increase consumer motivation to buy environmentally friendly, sustainable products. Consumers with high green consumption values, who see the world through "green-tinted glasses," as the authors figuratively described it (Haws et al., 2014, p. 336), generally respond more positively to green or sustainable products and their marketing (Bailey et al., 2018). Thus, they represent an important, and solidly growing target group (Haws et al., 2014).

However, development toward more sustainable consumption can benefit from green consumers and their interest in sustainable products only if these consumers recognize and perceive products as sustainable. While previous research has already shown that these consumers actively search for sustainability information (e.g., Leonidou & Skarmeas, 2017; Schuhwerk & Lefkoff-Hagius, 1995), it is still largely unclear how consumers assess the sustainability of a product based on the available information (Fischer et al., 2021; Sánchez-Chaparro et al., 2022). In a similar vein, in the field of Corporate Social Responsibility (CSR) research, stakeholder-perceived CSR has long been examined to investigate CSR impacts on the respective target audience (e.g., Becker-Olsen et al., 2006; Öberseder et al., 2014). To better target green consumers and gain a deeper understanding of how they process detailed sustainability information to evaluate product sustainability, we look from a consumer-centered perspective at sustainable consumer behavior and marketing.

Therefore, our research questions are two-fold. First, how do green consumption values influence consumers' sustainability perceptions of products and their associated brands?

Second, what are the roles that information processing and the perception of product sustainability benefits play?

In light of the elaboration likelihood model (ELM) and means–end chain theory (Gutman, 1982; Petty & Cacioppo, 1986), we argue that consumers do not automatically form an abstract perception of product sustainability. They need to see specific benefits that foster sustainability (i.e., environmental and social factors of a product that contribute to the environment and society), which we refer to as sustainability benefits, to form an overall more abstract sustainability perception (Dorce et al., 2021). In this sense, consumers must be able to interpret these pieces of information in a meaningful way when searching for sustainable products (Huber et al., 2004; White et al., 2019). The perception of these sustainability benefits based on detailed sustainability information about product characteristics varies among people with different degrees of green consumption values, such that it increases for people with high green consumption values compared to consumers low in these values. We argue that this occurs due to different levels of processing intensity with regard to the available sustainability-related information.

To answer our research questions, we surveyed 1,577 consumers, distributed across three food product categories: oyster mushrooms, meat substitutes, and fruit. For all products, we found that green consumption values positively influence perceptions of both environmental and social sustainability benefits. Additionally, we identify value-aligned environmental benefits as mediators of the effect of green consumption values on the overall sustainability perceptions of the product, which, in turn, determines the sustainability perception of the brand.

Our work contributes to the growing research on sustainable marketing and consumer behavior by documenting that consumer with different levels of green consumption values vary in their formation of abstract product sustainability perceptions based on sustainability product information. By drawing on means–end chain theory and the ELM in a preliminary investigation, we expand our understanding of information processing strategies and the perceptual process of product sustainability perception. Thus, our study provides an interesting starting point for further research on the role of sustainability information in the context of sustainable marketing. In addition, our findings provide implications for food marketers seeking to promote sustainable products to a growing consumer group.

The remainder of this article is structured as follows. The second section provides an overview of the literature and relevant assumptions of both means–end chain theory and the ELM. Based on this, we derive our conceptual framework and hypotheses. The third section

presents the methodology followed by the results. In the last section, we discuss our findings and implications as well as limitations and avenues for future research.

4.2 Green consumers' formation of sustainability perceptions of products and brands

Green consumption values describe a consumer's general inclination toward valuing the conservation of the environment and aligning their consumption practices accordingly; Haws et al. (2014) define this construct as "the tendency to express the value of environmental protection through one's purchases and consumption behaviors" (p. 337). Their research has shown that for products labeled as sustainable, people with high green consumption values not only evaluate the environmentally friendly attributes of the product more positively but also perceive attributes that are not environmentally friendly relatively more favorably through motivated reasoning. However, for consumers to behave in a value-consistent way, it is crucial that they recognize a product as sustainable in the first place (Summers et al., 2016). Especially in light of the large array of products promoted as sustainable, it is important to investigate how consumers with high green consumption values initially form their sustainability perceptions.

Sustainability as a multifaceted concept based on several dimensions cannot be evaluated by a consumer without drawing on integrated knowledge (Luchs & Miller, 2015; Sánchez-Chaparro et al., 2022). When it comes to sustainability information, consumers are confronted with a tremendous amount of (sometimes even contradictory) information (Chen & Chang, 2013; Franco & Cicatiello, 2019; Leonidou & Skarmeas, 2017; Shao, 2016). This specifically applies to food, as consumers must interpret numerous different indicators in order to judge degrees of sustainability. In addition to seasonality and locality, organic food or fair trade, carbon footprint, and other specific sustainability cues play a role (Grunert et al., 2014). In the presence of a substantial volume of complex information, green consumers must filter and interpret these diverse pieces of information in a meaningful way to form a global sustainability perception. In this context, how they form abstract and overall sustainability perceptions in the above-described rich information environments remains unclear.

The formation of sustainability and other types of perceptions is based on information processing in which consumers are exposed to various information stimuli that raise their attention and result in interpretative consideration (Mothersbaugh et al., 2020). This process unites elements of the means–end chain theory and the ELM. Therefore, established information processing theories were employed to inform the research question. While means–end chain theory refers to the process of how abstract product evaluations are formed based on relevant product attributes and their perceived consequences (Gutman, 1982; Huber et al.,

2004), the ELM is concerned with how the provided information details are processed depending on varying levels of involvement depending in part on consumers' ability and motivation to process information (Petty & Cacioppo, 1986; Petty et al., 1983).

Means–end chain theory explains how consumers' abstract product evaluations are formed by associating relevant product attributes with perceived consequences and desired purposes in a hierarchical manner (Gutman, 1982; Huber et al., 2004). The basic contours of the theory indicate that consumers evaluate products by associating pertinent product attributes with perceived consequences for relevant desired ends (Huber et al., 2004). Crucially, the desired end states are characterized by a markedly higher degree of abstraction than the product attributes (Huber et al., 2004).Therefore, consumers mentally form a chain when making buying decisions that link product attributes to benefits, which in turn contribute to the fulfillment of abstract values (Brunsø et al., 2004; Gutman, 1982). In the context of sustainability perceptions, having as little negative impact as possible on the environment and society as a goal of sustainable products (Lazzarini et al., 2017) is characterized by a significantly higher degree of abstractness than specific product attributes that are described as sustainable. Thus, means–end chain theory predicts that consumers with strong and relevant value sets will aim to interpret specific and detailed product benefit information and link that information to a more abstract appraisal of product sustainability (Lazzarini et al., 2017).

An important target group for sustainable products are green consumers who are interested in the topic of sustainability and want to express their concern for the environment through their purchasing decisions (Barbarossa & De Pelsmacker, 2016; Haws et al., 2014). Therefore, it is particularly interesting to investigate how this group perceives product sustainability benefits and links them to abstract sustainability perceptions. To increase understanding of the different strategies that consumers follow to process information while forming overall product and brand evaluations, dual-process models can be consulted. One of the most prominent of these is the ELM (Petty & Cacioppo, 1986).

According to the ELM, there are two main routes to the formation of evaluations, and ultimately, to persuasion (Petty & Cacioppo, 1986). One is the central route, which involves careful consideration and in-depth processing of the information presented, and the other is the peripheral route, which involves a more superficial processing of the information. This theory proposes that when consumers have the cognitive ability and motivation to process information, they are more likely to form their evaluation via the central route, which means that they form evaluations based on the quality and details of the provided information (Petty & Cacioppo, 1986; Petty et al., 1983). In contrast, consumers with lower levels of ability and/or motivation

to process information tend to rely more on superficial cues, such as the source of information or emotional appeals, characterizing the peripheral route to persuasion.

Figure 4-1 draws on and integrates both means-end theory and ELM theory to hypothesize the likely flow of the perception process that informs sustainability perceptions based on product-related sustainability benefit information.

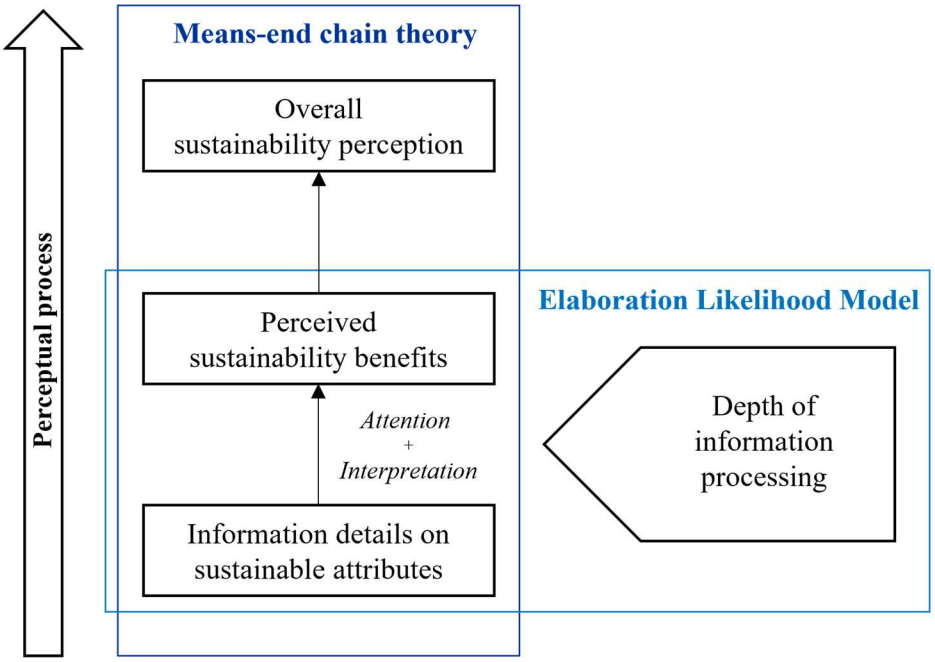

Figure 4-1. Theoretically assumed perceptual process.

4.2.1 Summary of predictions

Our conceptual model (see Figure 4-2) integratively considers the assumptions of both the means–end chain theory and ELM. It focuses on investigating the influence of green consumption values on abstract sustainability perceptions mediated by the perceived environmental and social sustainability benefits.

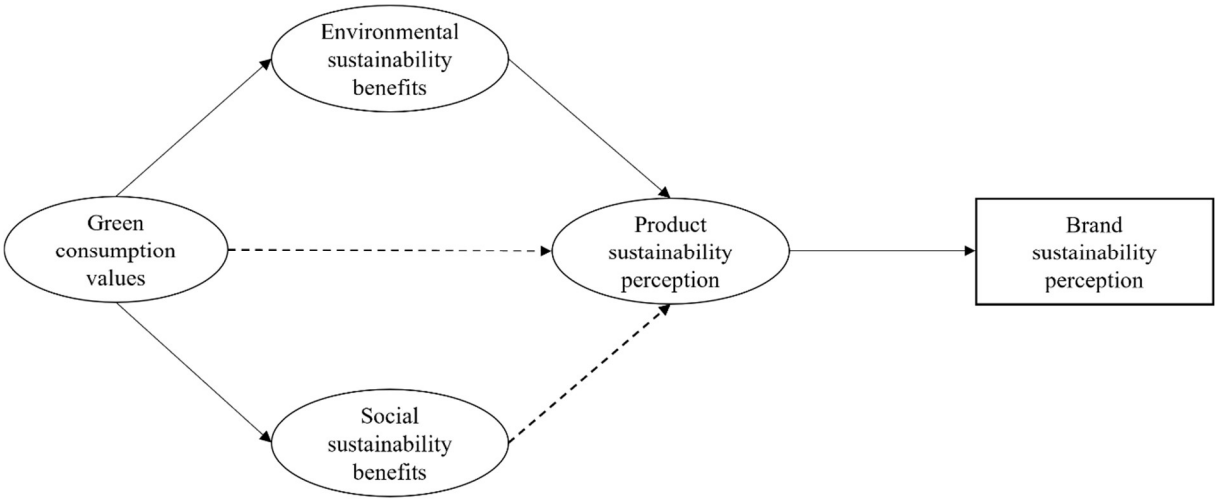

Figure 4-2. Conceptual model.

To derive predictions about how consumers with high green consumption values form their sustainability perceptions of products (and brands), we assume that these consumers can are particularly interested in sustainability (Haws et al., 2014). Sustainability-related information should be of higher perceived relevance to them in order to evaluate to which extent a product or brand aligns with their values they aim to express with their consumption. Given their higher motivation to process relevant information and engage cognitively (Borgstede et al., 2014; Lagerkvist et al., 2023; Schuhwerk & Lefkoff-Hagius, 1995), they are likely to utilize the central route of information processing (Petty et al., 1983). Deeper cognitive processing should enable them to interpret the information provided in a way that generates perceptions of product sustainability benefits (Cialdini et al., 1981). In this context, increased perceptions of sustainability benefits of a product are likely to reflect deeper cognitive processing among green consumers.

Referring to means–end chain theory, we assume that the evaluation of a product's alignment with consumer values follows an indirect rather than a direct process (Brunsø et al., 2004; Huber et al., 2004). Consequently, we do not assume that consumers holding green consumption values will directly perceive products as more sustainable; instead, their overall sustainability perception will likely be contingent on perceiving the sustainability benefits offered by the product (Huber et al., 2004; Meise et al., 2014). By sustainability benefits, we mean the concrete environmental and social factors of a product that contribute to the environment and society, for example, the reduction of greenhouse gas emissions, environmentally friendly land use, the reduction of water pollution, environmentally friendly resource use, fair wages for all people working in the value chain, good working conditions in

the value chain, and compliance with human rights throughout the value chain (Dorce et al., 2021).

Although green consumption values clearly relate to the environmental dimension of sustainability, we expect effects not only on perceptions of environmental but also on social sustainability benefits as well. This reasoning is based on prior research indicating that consumers who care about the environment also have social sustainability concerns and vice versa (e.g., Barbarossa & De Pelsmacker, 2016; Borgstede et al., 2014). The connection between environmental and social sustainability that consumers seem to make is apparently based on the overarching objectives of sustainability. In general, the goal of sustainability is to preserve the environment and society for the future (Brundtland, 1987; Elkington, 1997). Thus, the goal of protecting the environment is grounded in the goal of preserving one's own species and enabling future societies to live on our planet. Although both spheres are characterized by different foci, they are likely to be connected in people's minds, as both are directed toward creating a sustainable future for mankind. Due to the interconnectivity and joint overarching goal of environmental and social sustainability, we assume that stronger green values will impact perceptions of both environmental and social product benefit. Thus, we hypothesize:

H1 *Green consumption values will positively influence the extent to which consumers perceive the environmental and social sustainability benefits of a product.*

Therefore, product sustainability benefits are likely to link concrete product attributes and the higher-level, more abstract perception of product sustainability (Brunsø et al., 2004; Gutman, 1982). However, this link should be stronger when perceived benefits are in line with desired end states. In general, consumers build their perceptions and choices based on information that is congruent with their self-identity and values (Hoogland et al., 2007; McAlexander et al., 2002; Verplanken & Holland, 2002). Means–end chain theory supports this congruence effect, as it describes a consumer's goal to choose products or brands that fulfill their core values (Gurel-Atay et al., 2017; Huber et al., 2004).

Whereas social benefits are related to the overarching goal of sustainability and are therefore also perceived more strongly by green consumers, they do not relate to the specific goal of green consumption values (i.e., an expression of environmental concern through shopping behavior; Haws et al., 2014). Hence, environmental sustainability benefits pertain more concretely to how the product helps to achieve the value-aligned goal of environmental preservation (Hoogland et al., 2007; McAlexander et al., 2002; Verplanken & Holland, 2002). Therefore, the mediation of green consumption values on product sustainability perceptions is

more likely to occur through environmental rather than social benefits. Consequently, we hypothesize:

H2 *Environmental sustainability benefits of the product will mediate the effect of green consumption values on the sustainability perception of the product. There will be no such mediation via social sustainability benefits.*

In general, brands' product benefit descriptions can serve as brand image cues. Therefore, product perceptions influence the perception of the brand itself (Berger et al., 2007). In a market environment where a product's sustainability benefits are increasingly important, it is not only worthwhile for brands to offer sustainable product alternatives, but also to differentiate through a sustainable brand image (Baalbaki & Guzmán, 2016; Becker-Olsen et al., 2006). Notably, perceived product sustainability can extend to other domains, such as perceptions of brand sustainability. Sustainable products can be seen as tangible representation of a brand's sustainability efforts (Brown & Dacin, 1997; Golob et al., 2022). They indicate that when it comes to the life cycle of its products, the brand prioritizes environmental and social responsibility. In addition, the increased prominence of specific product attributes or perceptions affects related brand evaluations (Gardner, 1983). Thus, we expect that an increase in product sustainability benefit perceptions and therefore a greater prominence of the products' sustainability will have a positive effect on brand sustainability perception, leading to our final hypothesis:

H3 *An increase in product sustainability perceptions will lead to increased brand sustainability perception.*

4.3 Methods

4.3.1 Sample and data collection

To empirically test our conceptual framework, we partnered with food suppliers from Europe (Hungary, the Netherlands, and Poland) and drew three consumer samples for three different food products (oyster mushrooms, bean-based meat substitutes, and fruit). The consumer samples represented the companies' corresponding potential target markets. These were primarily associated with national markets with the exception of oyster mushrooms, which were distributed in Hungary and Southern Germany. We chose fruit and vegetable products to

account for differences among them, with various levels of preprocessing and extent of preparation by the consumer. For the samples, we used consumers for whom the product category was of interest, and the samples were representative of the country in which the food suppliers operated. The participants were recruited via a market research agency using a consumer access panel. A formal, structured questionnaire was developed to collect responses and was distributed online. The survey was designed in English and translated into the corresponding national languages. To validate the translations, ambiguous parts or unclear cases were back-translated and discussed in feedback loops between the research team and the translators.

All potential respondents were first asked to read and confirm the informed consent guidelines before completing the remainder of the survey. After providing demographic data, each participant was presented with a brief description of either a sustainable oyster mushroom, meat substitute, or fruit value chain based on the real business cases of our partner food suppliers (please see the anonymized descriptions of the value chains in Table 4-1). Based on this information, the participants then rated various product-related variables, including the perceived sustainability benefits of the presented product, perceived product sustainability, and brand sustainability. After an unrelated survey section that addressed the importance of various attributes of products from the corresponding product category, participants were asked to complete a section containing items that measured personal attitudes and values, including green consumption values.

Data collection took place between February and July 2022 and yielded a total of 1,625 participating consumers. We only included responses without missing values in our analyses; hence, 48 cases were excluded, resulting in a final sample of $N = 1{,}577$ ($n_{\text{oyster mushrooms}} = 514$, $n_{\text{meat substitute}} = 551$, $n_{\text{fruit}} = 512$). The socio-economic profile of the sample is provided in Table 4-2.

Product	Description
Oyster mushrooms	XXX is a family-run medium-sized enterprise that has been working in the field of mushroom cultivation for almost 30 years. Currently, it is the largest oyster mushroom producer in Central Europe with its fresh oyster mushroom widely available in retail stores in Hungary and beyond. The main activities include substrate production for oyster mushroom, as well as cultivation and distribution of fresh oyster mushrooms in wholesale and retail markets, and *generation of electric power and heat energy from biogas production from the by-product of mushroom production securing zero waste approach and nutrient recycling*. The company also produces and sells *organic* fresh oyster mushroom with using *organic certified wheat straw as substrate material*. Either organic or conventional, XXX pays extra care that the mushroom production is *fully free of chemicals and pesticides*, which is backed by conscious technology development. This is the reason why the activity of XXX is in full compliance with the conditions of *organic mushroom production, and it is also officially certified* by Biokontroll Hungária Nonprofit Ltd.
Bean-based meat substitute	XXX is a platform for innovation and transition of the global food system which has a business community for ingredient suppliers, food manufacturers and other actors in the field of plant-based, vegan or vegetarian products. Currently, there is about 1.000 hectare of land where fava beans – a traditional Dutch bean – are harvested. Fava beans can be *processed by energy-efficient technologies* to deliver ingredients and consumer ready products that are *locally grown*, *without GM or other additives*. One of XXX's partners – XXX – offers different meat analogues based on fava beans that are *vegan* and *soy-free meat replacer*. The products can be bought in cold storage and are packaged within plastic trays with a cardboard sleeve.
Fruit	XXX is an association of 20 Polish farmers that produce fruits in an *organic farming system and use probiotics*. They manage more than 600 hectares of organic orchards and collect about 30,000 tons of organic fruits every year. Their cultivation methods of the *cooperative* aim to *develop regenerative agriculture and improve the quality of the products* that contain 40 – 50 % more nutrients, vitamins and minerals than fruits from conventional production. Additionally, the method s*trengthens soil protection and leads to constant improvement of the soil fertility.* The *organically produced fruits* are sold as single fruits, in so-called 1 day packaging (4 pieces of fruit) or in large 1.5 – 3 kg family packages.

Note: Sustainability aspects in the value chain descriptions are italicized.

Table 4-1. Descriptions of the value chains.

Variables		Oyster mushrooms (OM)	Meat substitutes (MS)	Fruits (FR)
Gender	Male (%)	48.64	49.55	50.20
	Female (%)	51.17	50.27	49.80
	Other (%)	.19	.18	.00
Age	Years (mean)	47.80	46.79	44.26
Education	Low (ISCED 0-2) (%)	11.67	24.14	4.49
	Middle (ISCED 3-4) (%)	64.59	41.02	65.82
	High (ISCED 5-8) (%)	23.74	34.85	29.69
Sample size	Persons	514	551	512

Table 4-2. Socio-demographic profile of respondents.

To reduce the potential for common method variance, we implemented different procedural remedies provided by Podsakoff, MacKenzie, Lee, & Podsakoff (2003). We placed the independent and dependent measures in different thematic sections to make them seem less closely related. Also, we assured respondents at several points throughout the questionnaire that we did not intend to evaluate the participants themselves but emphasized our interest in their personal, subjective views. Additionally, we took great care to improve the comprehensibility of the questionnaire by avoiding complex questions and vague concepts, and focused on using concise and straightforward language. Apart from these preventative measures, we also examined common method bias statistically using Harman's single factor test. It revealed a common method variance of 47.20%, which is below the recommended threshold of 50% (Podsakoff et al., 2003). Since it was relatively close to the threshold, we included a common method variable in our structural model. No differences were apparent between the structural model with and without the common method factor in either effect coefficients or significances. This suggests that a common method bias did not seem to affect the reliability, validity, and parameter estimates to any worrying extent; consequently, we continued our analysis (Fuller et al., 2016; Podsakoff et al., 2003).

4.3.2 Measures

To measure relevant constructs, we employed established items, using seven-point Likert-type scales (see Table 4-3 for all constructs and measurement items). To measure green consumption values, we used the six-item scale developed by Haws et al. (2014). Dorce et al. (2021) proposed a formulation for statements to capture perceived sustainability benefits at the product level (e.g., *"I believe the regular purchase of this product contributes to [sustainability benefit]").* We adopted this formulation and adjusted the choice of environmental and social sustainability benefits to fit fruit- and vegetable-based food products based on Lazzarini et al. (2017).

We were then able to ask the participants whether they thought that the regular purchase of the corresponding product would contribute to four environmentally sustainable benefits (the reduction of greenhouse gas emissions, environmentally friendly land use, water pollution, and environmentally friendly resource use) and three socially sustainable benefits (fair wages for all people in the value chain, good working conditions in the value chain, and compliance with human rights throughout the value chain). The perceived sustainability of the product was assessed using three items (that were adapted slightly) proposed by Gershoff and Frels (2015):

"*This [product] deserves to be labeled 'sustainable.' Purchasing this [product] is a sustainable choice, and a person who cares about sustainability would be likely to buy this [product].*"

To capture an overarching, homogeneous perception of brand sustainability, while reducing participant burden and avoiding potential fatigue bias, we opted for a single-item measure. In the case of homogeneous constructs, single-item measures have been shown to perform equally well as multi-item measures (Diamantopoulos et al., 2012). Additionally, we controlled for age and gender because those demographic variables regularly impact (sustainable) food consumption variables (e.g., Verain et al., 2021).

Construct	Variable	Item	Source
Green consumption values (GCV)	GCV1	It is important to me that the products I use do not harm the environment.	Haws et al. (2014)
	GCV2	I consider the potential environmental impact of my actions when making many of my decisions.	
	GCV3	My purchase habits are affected by my concern for our environment.	
	GCV4	I am concerned about wasting the resources of our planet.	
	GCV5	I would describe myself as environmentally responsible.	
	GCV6	I am willing to be inconvenienced in order to take actions that are more environmentally friendly.	
Environmental sustainability benefits (ESB)	ESB1	I believe that the regular purchase of this product contributes to the reduction of greenhouse gas emissions.	adapted from: Dorce et al. (2021), and Lazzarini et al. (2017)
	ESB2	I believe that the regular purchase of this product contributes to an environmentally friendly land use.	
	ESB3	I believe that the regular purchase of this product contributes to the reduction of water pollution.	
	ESB4	I believe that the regular purchase of this product contributes to an environmentally friendly resource use.	
Social sustainability benefits (SSB)	SSB1	I believe that the regular purchase of this product contributes to fair wages for all people working in the value chain.	
	SSB2	I believe that the regular purchase of this product contributes to good working conditions in the value chain.	
	SSB3	I believe that the regular purchase of this product contributes to compliance with human rights throughout the value chain.	
Product sustainability perceptions (PSP)	PSP1	This product deserves to be labeled "sustainable".	Gershoff & Frels (2015)
	PSP2	Purchasing this product is a sustainable choice.	
	PSP3	A person who cares about sustainability would be likely to buy this product.	
Brand sustainability perceptions (BSP)	BSP	This brand is a very sustainable brand.	Baalbaki & Guzmán (2016)

Table 4-3. Measures and items.

4.3.3 Results

Using AMOS 29, we conducted a confirmatory factor analysis (CFA) with the latent constructs of green consumption values, product sustainability benefits, and product sustainability perception to assess their convergent and discriminant validity (see Table 4-4). Brand sustainability perception was included as a manifest variable in the CFA. Convergent validity was evaluated using factor loadings (>.70), composite reliabilities (>.80), and average variance extracted (AVE > .50) with the indicated threshold values as criteria (Anderson & Gerbing, 1988; Fornell & Larcker, 1981). As all AVEs were greater than the squared correlations of the between-measure pairs, the CFA was judged to exhibit discriminant validity (Fornell & Larcker, 1981). To evaluate the model fit, we relied on a set of indices and suggested threshold values: the normed chi square (<5.0), comparative fit index (CFI ≥ .95), Tucker–Lewis index (TLI ≥ .96), normed fit index (NFI ≥ .90 or .95, according to the source), the root mean square error of approximation (RMSEA ≤ .06), and the standardized root mean square residual (SRMR ≤. 08; Bentler & Bonett, 1980; Hu & Bentler, 1999; Wheaton et al., 1977). The fit of the measurement model was considered satisfactory according to meeting all the listed criteria (see Table 4-4 and Table 4-5).

Construct	Item	Mean (SD)			FL		
		OM	MS	FR	OM	MS	FR
Green consumption values (GCV)	GCV1	4.94 (1.48)	4.85 (1.35)	5.49 (1.37)	.857	.737	.820
	GCV2	4.61 (1.41)	4.66 (1.35)	5.12 (1.42)	.888	.826	.843
	GCV3	4.44 (1.53)	4.47 (1.42)	5.05 (1.50)	.842	.785	.854
	GCV4	5.22 (1.61)	4.97 (1.42)	5.59 (1.42)	.766	.748	.752
	GCV5	4.61 (1.41)	4.60 (1.33)	5.12 (1.37)	.765	.743	.801
	GCV6	4.49 (1.50)	4.48 (1.35)	4.97 (1.49)	.790	.668	.840
Environmental sustainability benefits (ESB)	ESB1	4.32 (1.59)	4,73 (1.38)	4.92 (1.55)	.898	.826	.825
	ESB2	4.59 (1.51)	4.82 (1.31)	5.18 (1.49)	.921	.848	.925
	ESB3	4.31 (1.55)	4.65 (1.26)	5.10 (1.47)	.907	.820	.924
	ESB4	4.55 (1.60)	4.80 (1.29)	5.20 (1.48)	.911	.861	.933
Social sustainability benefits (SSB)	SSB1	4.25 (1.53)	4.59 (1.28)	4.90 (1.51)	.938	.896	.928
	SSB2	4.27 (1.55)	4.59 (1.29)	5.00 (1.50)	.949	.896	.956
	SSB3	4.12 (1.65)	4.45 (1.38)	5.00 (1.51)	.906	.788	.930
Product sustainability perceptions (PSP)	PSP1	4.94 (1.50)	4.84 (1.27)	5.20 (1.48)	.944	.888	.931
	PSP2	4.91 (1.50)	4.88 (1.25)	5.22 (1.46)	.931	.897	.942
	PSP3	5.06 (1.51)	4.95 (1.29)	5.28 (1.50)	.861	.821	.911

Note: OM = Oyster mushrooms, MS = meat substitute, FR = fruit, FL = factor loadings; fit indices measurement model: normed $\chi^2 = 3.548$ (df = 330), $p = .00$; CFI = .97; TLI = .96; NFI = .95; SRMR = .03; RMSEA = .04; $N = 1{,}577$.

Table 4-4. Latent constructs with observable items, factor loadings, and scale reliability.

Oyster mushrooms								
Construct	Mean	SD	AVE	CR	GCV	ESB	SSB	PSP
GCV	4.72_a	1.28	.671	.924	*.819*			
ESB	4.44	1.48	.827	.950	.503	*.909*		
SSB	4.21	1.51	.867	.951	.475	.860	*.931*	
PSP	4.97	1.42	.833	.937	.431	.761	.651	*.913*
BSP	5.08	1.43	-	-	.365	.661	.566	.840
Meat substitute								
Construct	Mean	SD	AVE	CR	GCV	ESB	SSB	PSP
GCV	4.67_b	1.09	.596	.898	*.772*			
ESB	4.75	1.15	.704	.905	.601	*.840*		
SSB	4.54	1.20	.742	.896	.518	.796	*.861*	
PSP	4.89	1.16	.756	.903	.457	.796	.674	*.870*
BSP	4.88	1.29	-	-	.353	.594	.548	.751
Fruits								
Construct	Mean	SD	AVE	CR	GCV	ESB	SSB	PSP
GCV	5.22_{ab}	1.22	.671	.924	*.819*			
ESB	5.10	1.38	.827	.915	.570	*.903*		
SSB	4.99	1.44	.816	.930	.546	.874	*.903*	
PSP	5.23	1.41	.861	.949	.517	.853	.733	*.928*
BSP	5.22	1.47	-	-	.397	.657	.606	.690

Note: AVE = average variance extracted; CR = composite reliability; square roots of AVE are given on the diagonal (in italics); all correlations significant at the 1% level. GCV: The same subscripts indicate significant differences between the means at the 5%-significance level based on Games-Howell post-hoc test results.

Table 4-5. Means, standard deviations, and bivariate correlations.

To test H1-H3, maximum likelihood (ML) estimation was used to analyze the fit of the hypothesized structural model to the respondent data. Model fit was determined to be adequate for all three product categories (see Table 4-6). To assess mediating effects, we used the bias-corrected bootstrap method (MacKinnon, 2017). This approach does not assume a normal distribution and generates asymmetric confidence intervals as non-parametric approximations of the sampling distribution. If the value of zero is not part of the 95% bootstrap confidence interval around an indirect effect, the indirect effect is significant at the .05 level (MacKinnon, 2017). For the procedure, we used 10,000 bootstrap samples from the data.

Paths and Correlations	Oyster mushrooms			Meat substitute			Fruits		
	B	*β*	*p*	*B*	*β*	*p*	*B*	*β*	*p*
GCV ←ESB	.575	.507	.000	.685	.600	.000	.645	.548	.000
GCV ← SSB	.553	.484	.000	.604	.522	.000	.685	.556	.000
GCV ← PSP	.059	.053	.169	-.042	-.037	.377	.057	.047	.170
ESB ← PSP	.743	.754	.000	.713	.716	.000	.933	.867	.000
SSB ← PSP	-.018	-.018	.801	.128	.130	.035	-.045	-.046	.471
PSP ← BSP	.852	.842	.000	.857	.754	.000	.751	.701	.000
ESB ↔ SSB	1.266	.817	.000	.633	.715	.000	.995	.819	.000

Note: Controls: age and gender. Fit indices measurement model: normed χ^2= 3.457 (df = 420), p = .00; CFI = .96; TLI = .95; NFI = .94; SRMR = .03; RMSEA = .04.

Table 4-6. Results of the structural model.

H1 posited that green consumption values would positively influence the perception of the (environmental and social) sustainability benefits of a product. Structural models for all three product categories showed significant direct effects of green consumption values on the perceived environmental sustainability benefits of the products (Oyster mushroom: B_{OM} = .575, meat substitute: B_{MS} = .685, fruit: B_{FR} = .645, all p < .001). The same applied to the direct effect of green consumption values on social sustainability benefits (B_{OM} = .553, B_{MS} = .604, B_{FR} = .685, all p < .001). Thus, green consumption values positively influence perceptions of both types of sustainability benefits.

H2 predicted that the environmental benefits would mediate the effect of the values whereas the social benefits would not, as they would be more in line with the green consumption values. For all three products, perceived environmental sustainability benefits showed a significant direct effect on product sustainability perception (B_{OM} = .743, B_{MS} = .713, B_{FR} = .933, all p < .001). At the same time, the path between perceived social sustainability benefits and product sustainability perception was not significant for oyster mushrooms and fruits. However, for the meat substitute sample, we found a small positive direct effect of perceived social sustainability benefits on product sustainability perception (B_{MS} = .128, all p = .035).

The direct effect of green consumption values on product sustainability perception was not significant for any of the three products. We tested the significance of the indirect paths via sustainability benefits using bootstrapping. The results confirmed that perceived environmental sustainability benefits mediated the relationship between green consumption values and product sustainability perception (see Table 4-7). The indirect effect via social sustainability benefits was not significant; this was also the case for the meat substitute sample.

	Oyster mushrooms			Meat substitute			Fruits		
	B	95% CI	*p*	*B*	95% CI	*p*	*B*	95% CI	*p*
Indirect effect via environmental sustainability benefits									
GCV ← PSP	.427	.288; .585	.000	.488	.352; .649	.000	.602	.470; .750	.000
Indirect effect via social sustainability benefits									
GCV ← PSP	-.010	-.125; .122	.916	.077	-.019; .185	.108	-.031	-.125; .072	.544

Table 4-7. Test of environmental sustainability benefits as mediator.

By taking together the non-significant direct effect of green consumption values on product sustainability perception and the significant indirect path via perceived environmental sustainability benefits, we identified a significant indirect-only mediation (Zhao et al., 2010). These results show a linkage between abstract green consumption values and general product sustainability perceptions via the perceived environmental sustainability benefits of the product.

H3 predicted that an increase in product sustainability would ultimately lead to an increased brand sustainability perception. Our results indeed showed a significant direct effect of product sustainability perception on brand sustainability perception (B_{OM} = .852, p < .001, B_{MS} = .857, p < .005, B_{FR} = .751, p < .001).

4.4 Discussion

The present study provides new insights into the impact of green consumption values on the sustainability perception of products and brands through the lens of information processing. We capture those links in a preliminary correlational study using scenarios based on real-world food value chains and a large representative consumer sample. With regard to our research question, we report three key findings. First, both product environmental and social sustainability benefits are more strongly perceived if consumers hold higher green consumption values. Second, environmental sustainability benefits mediate the effect of green consumption values on a product's overall sustainability perception. Our study provides initial evidence that this mediation relationship may not hold for social sustainability benefits. Third, increased product sustainability perceptions positively influence brand sustainability perceptions as well.

While means–end chain theory emphasizes the formation of a (sustainability) perception by linking product attributes to more abstract values, the ELM considers the varying levels of information processing. This study indicates that consumers' formation of sustainability perception follows a hierarchical structure (Gutman, 1982; Huber et al., 2004; Mothersbaugh et al., 2020) in which in-depth processing of sustainability-related information

is enhanced through thematical involvement (Petty & Cacioppo, 1986; Petty et al., 1983). Our study suggests that product sustainability benefits may play a significantly stronger role in judgements of overall product and brand sustainability for consumers who hold stronger green consumption values (Meise et al., 2014; Shao, 2016; White et al., 2019). Green consumers appear to more thoroughly process sustainable product information, and therefore, tend to recognize a products' sustainability benefits more strongly. Based on this, they seem to form a perceptual chain linking environmental sustainability benefits to the overall sustainability perception of the product. Thus, we not only confirm previous findings on the importance of presenting product sustainability benefits (Dorce et al., 2021; Meise et al., 2014), but also extend them by revealing the role of green consumption values in recognizing them based on consumers' information processing and their impact in the formation of product sustainability perception. In this sense, it seems that people who see the world through "green-tinted glasses" can potentially be supported in their value-related consumption behavior by firms providing extensive sustainability information and highlighting product sustainability benefits.

However, in this regard, our results indicate that perceived environmental benefits may have a significant positive impact, while social benefits may not. Given a more natural alignment of environmental benefits with green consumption values, many consumers' understanding of sustainability may be more environmental than social in nature (e.g., Sander et al., 2021). This may reflect the global development of sustainable development. The environmental pillar of sustainability has been part of the discourse since at least the first UN Earth Summit focusing on preventing climate change in the 1970s (United Nations, 2007). Over the time, a strong awareness of the environmental dimension of sustainability has grown among consumers (Haws et al., 2014; Sander et al., 2021).

Nonetheless, it is interesting to note that green consumption values may also have a halo effect on the perceived social sustainability benefits of a product. This could be due to a growing awareness that sustainability consists of several dimensions, and the joint overarching goal of both dimensions is to preserve nature and society for the future (Brundtland, 1987; Elkington, 1997). Accordingly, it would make sense to invest more in consumer education on the social pillar of sustainability to strengthen the influence of social benefits on product and brand sustainability perceptions (Franco & Cicatiello, 2019). In the consumer sample for the meat substitutes in our study, we observed this positive effect. Although we can only speculate about the reasons for this, it is conceivable that consumers of meat substitutes are among those who have already been more involved with the topic of sustainability and may therefore be sustainability forerunners (Siegrist & Hartmann, 2019). Thus, a more holistic understanding

and integration of social sustainability benefits into the overall sustainability perception are reasonable among this group. In this respect, we contribute to research by using a broader concept of sustainability that not only refers to environmental sustainability but also includes the social dimension. Prior research often treats multiple sustainability-related aspects as "sustainable" without allowing a finer-grained analysis of the differential impacts of the environmental and social dimensions (Luchs & Miller, 2015). We take a new perspective and add to consumer research on more comprehensive understandings of sustainability, as we indeed show differential impacts of perceived environmental and social sustainability benefits.

In addition, the study revealed a positive effect of the increased sustainability perceptions of a product on the sustainability perceptions of the brand. Our findings therefore suggest that the deeper processing of product sustainability benefits by green consumers which then leads to an increased product sustainability perception translates into higher brand sustainability perceptions. Brands that offer information details on the sustainable features of their products may also build stronger sustainable brand reputations among green consumers (Golob et al., 2022).

4.4.1 Practical implications

Because the food system has a critical role to play in reducing greenhouse gas emissions, improving managerial understanding of the influence of green consumption values on sustainability perceptions is clearly important (Crippa et al., 2021). Sustainable development in this sector largely depends on the commercial success of sustainable products. Even if consumers are increasingly interested in sustainable products, they have to recognize them as such in order to make more sustainable product choices. Our findings offer implications for all food marketers and other practitioners responsible for providing information about sustainable (food) products. In particular, we provide initial evidence that consumers who hold stronger green values may process product sustainability information more deeply and more clearly recognize product sustainability benefits based on this process, increasing overall perceptions of product and brand sustainability.

Food marketers can support this process by more effectively targeting green consumers and providing clear product stainability benefit information in their marketing communications so that these consumers can easily understand the environmental and social sustainability benefits a product delivers. In addition, at least implicitly, our results indicate that merely communicating that a product is sustainable without providing evidence in the form of benefits may not be sufficient. Given that our survey product sustainability benefits were all very

concrete (e.g., the reduction of emissions and energy use in the production process or the environmentally friendly sourcing of raw materials), simply labeling a product as sustainable without further explanation may not be sufficient.

Therefore, our results encourage practitioners to take opportunities to communicate and outline the sustainability benefits of their products to green consumers in some detail. This adds to the growing empirical evidence that providing consumers with information is important for facilitating the comprehension of sustainability efforts, reducing greenwashing perceptions, and positively influencing other consumer responses (Atkinson & Rosenthal, 2014; Chen & Chang, 2013). Providing sustainability details that green consumers use to shape their sustainability perceptions can also be valuable in that perception changes triggered via the central pathway are more stable and have longer-term effects on consumer responses (Cialdini et al., 1981).

In light of our findings, in-store information on environmental sustainability seems likely to be particularly helpful in recalling cognitive links between green consumption values and value-aligned benefits during the purchase phase. In addition, the use of social media could be leveraged in terms of consumer education on social sustainability. Consumers may be under less time pressure while using social media than in a shopping situation and can consequently absorb messages on the meaning of social sustainability in the food sector more effectively. In this way, practitioners can support the predisposition of consumers with green consumption values which may, in turn, increase the probability that perceived social sustainability benefits translate into improved overall product and brand sustainability perceptions.

4.4.2 Limitations and future directions for research

Finally, our study is not free of limitations. First, we combined elements of two well-established theoretical approaches and provided correlational insights. Although having a study based on real-world business cases and large consumer samples are strengths, this approach does not employ an experimental design that would have been able to test the theoretical assumptions in a more rigorous way. In an experiment, we could have varied the available pieces of information (e.g., concrete sustainability benefits in comparison to more abstract product sustainability information) or the applied selling arguments typically used in food marketing campaigns. However, the insights from our correlational approach provide starting points for a variety of experimental investigations in future research.

Second, our data were collected in an online survey that presented the product without providing information about alternative and more conventionally produced foods, as would be the case in a typical grocery shopping trip. However, as increasing numbers of consumers order

food online and buy it from direct marketers, this limitation may be less important than in the past. Nonetheless, the impact of perceived sustainability benefits compared to conventional counterparts should be investigated by future studies. By presenting sustainable products alongside conventional equivalents, the benchmark for perceived sustainability benefits could be altered and the mechanism influenced as a result (e.g., van Herpen & Bosmans, 2018).

In addition to these concerns, identifying optimal forms for sustainability benefit information presentation remains an important avenue for future research. In our study, participants were given brief text descriptions of the respective value chains for the products. In a real shopping context, this information would have to be presented differently, that is, in a format which is more common in the marketplace. Future research in connection with sustainability benefits could, for example, vary the presentation format, information specificity, and/or the amount of information (Atkinson & Rosenthal, 2014; Turunen & Halme, 2021).

Furthermore, non-food products may benefit from providing sustainability benefit information. Also, presenting sustainability benefits through simpler cues could potentially appeal to less green-minded consumer groups. Thus, future research should shed light on how sustainability benefits can be communicated to people with lower green consumption values who do not deeply process information details (Borgstede et al., 2014; Petty et al., 1983; Schuhwerk & Lefkoff-Hagius, 1995).

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5. Facts over stories: How sustainability storytelling can backfire

Abstract

Communicating sustainability effectively to consumers is a challenge for brands. In light of this, storytelling has been proposed as an advertising tool for sustainability. While in a general advertising context, narrative ads have shown to be particularly persuasive, this may not be true for sustainability advertising. Especially in communication areas in which consumer skepticism prevails, consumers often have a greater desire for information. We therefore investigate the impact of narrative sustainability ads compared to factual and hybrid ads. Our experimental study shows that narrative ads without factual sustainability information negatively influence consumer responses due to increased greenwashing perceptions and a lower perceived amount of information. The study contributes empirical evidence to the discourse on narratives in sustainability advertising, highlighting the need for a careful integration of emotional storytelling and factual information to for practitioners.

Keywords: storytelling, factual information, sustainability communication

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Current status of the paper: This paper is submitted to the *European Marketing Academy Conference* (EMAC) 2024 in Bucharest. The formatting of this paper has been adjusted to fit the formatting of this dissertation.

5.1 Introduction

In the midst of peaceful nature, a Coca-Cola plastic bottle catches the eye of a ladybug. What happens then? The ladybug mobilizes all its forces and is supported by many ants. Together, they manage to transport the bottle to a garbage can. Now that they have succeeded, nothing can stop the bottle from being recycled. What sounds like a little story, is actually the storyline of a Coca-Cola advertisement (Coca-Cola Australia, 2019). The story is followed by the information that Coca-Cola bottles are now made from 100% recycled plastic. The brand thus combines elements of two different forms of advertising: a narrative advertisement is supplemented by factual information. Narrative ads, employing stories to convey advertising information, usually resonate well with consumers, as they naturally think in a story-like form (Escalas, 2004). In line with this, substantial research already identified narrative formats as more persuasive than fact-based ones (Escalas, 2004; Shen et al., 2015). As narrative advertising, also named storytelling, is well suited to conveying values, storytelling is proposed as an effective tool for sustainability communication (Dessart, 2018).

However, the use of narrative ads in the sustainability context has scarcely been investigated empirically. Additionally, the few existing studies tend to examine mixed forms such as the Coca-Cola ad described above, which include sustainability facts as well as the story (Huang & Guo, 2021; Kim et al., 2022). The persuasive effectiveness of purely narrative elements for sustainability advertising therefore remains unclear. We address this research gap and look at the following research question: How do narrative sustainability ads impact consumer responses (in comparison to factual and hybrid ads that combine narrative and factual elements)?

To answer this question, we use an experimental research design based on three conditions (factual, narrative, and hybrid sustainability ad). We show that presenting a narrative ad without factual sustainability information negatively impacts consumer responses due to increased greenwashing perceptions and a lower perceived amount of information. We offer interesting empirical insights for further research on how storytelling can be used for effective sustainability communication and to inform practitioners about potential pitfalls of storytelling in sustainability communication.

5.2 Persuasion in the context of sustainability communication

The field of persuasion in advertising is strongly characterized by traditional information processing theories such as the elaboration-likelihood model (ELM) (Petty & Cacioppo, 1986). The ELM proposes two routes of persuasion: either a careful or a more

superficial processing of information, depending on the cognitive ability and motivation of the individual consumer (Petty & Cacioppo, 1986). Thus, the persuasive power of advertisements results from the information provided by brands and processed by consumers (in varying depth). This inevitably involves advertisements that contain factual information.

In contrast, there are so-called narrative advertisements. Storytelling, the use of narratives in ads, is increasingly mentioned as a strategic branding practice to communicate change, such as a brand's sustainable development (Dessart & Standaert, 2023). Narrative structures, or stories, generally involve four key elements which are a plot, one or more characters, climax, as well as an outcome (van Laer et al., 2014). Advertisements therefore employ storytelling when they include actors with specific motives who live through a sequence of events (Escalas, 2004). Considerable research has focused on the impact of narrative ads in a general advertising and branding context (e.g., Escalas, 2004; Wentzel et al., 2010). These studies commonly identify a different form of persuasion in narratives than in more traditional, fact-based forms of advertising.

Narrative persuasion refers to the impact on attitudes and behavior through narrative forms of communication that are not predominantly argumentative (van Laer et al., 2014). Persuasive effects are not conceptualized as a consequence of analytical information processing, but rather as a consequence of experiential states associated with the narratives (Green & Brock, 2000). Consumers confronted with a narrative ad engage deeply with the story, directing their attention toward processing the narrative (Lien & Chen, 2013). As a result, they may invest less cognitive effort into processing brand- or product-relevant information (Green & Brock, 2000). Therefore, for narrative ads emotions instead of factual information is the key to its persuasive influence (Lien & Chen, 2013).

There is already substantial research that examines the effects of narrative and fact-based messages on persuasion-related outcomes that frequently identifies narrative formats as more persuasive than facts under several conditions (Shen et al., 2015; van Laer et al., 2014). Following on from this, some researchers also consider storytelling to be highly effective in the context of sustainable marketing (Dessart & Standaert, 2023). This is based on the idea that authenticity and credibility are core components of successful sustainability communication and are conveyed primarily through emotions which in turn are a central element of stories (Dessart & Standaert, 2023). However, there have only been a few studies to date that have empirically tested storytelling in the context of sustainability communication (Huang & Guo, 2021; Kim et al., 2022).

We argue that although sustainability communication includes emotional aspects, it has specific peculiarities that make it difficult to transfer the results from the general advertising field. First, sustainability is a multifaceted, complex topic that is often difficult for consumers to grasp (Gleim et al., 2013). In its complexity, it therefore goes beyond other advertising-relevant aspects, such as specific product or service characteristics or brand attributes, and differs in that it often incorporates a scientific perspective (Winterich et al., 2023). Second, sustainability is a credence attribute that cannot be experienced directly (Atkinson & Rosenthal, 2014). Thus, to form an impression of a brand's sustainability, consumers have to rely on the information provided by the brand and external sources (Leonidou & Skarmeas, 2017). When consumers are exposed to sustainability communication, they find themselves in an evaluation process in which factual information is of importance. Additionally, the context of sustainability communication is characterized by consumers often being skeptical about the information provided (Chen & Chang, 2013; Leonidou & Skarmeas, 2017). Prior experiences with greenwashing lead to uncertainties about the accuracy and credibility of corporate sustainability communication (Chen & Chang, 2013; Gleim et al., 2013). The general skepticism toward sustainability information in turn increases the consumer's desire for information (Leonidou & Skarmeas, 2017). In communication situations where recipients are skeptical, factual information is therefore more relevant, which opposes storytelling as an advertising tool (at least when implemented without integrated factual information). Thus, our first hypothesis is:

H1 *Compared to a factual sustainability ad, a narrative ad without factual sustainability information negatively affects a) attitude toward the ad, b) ad credibility, and c) brand authenticity.*

As outlined above, the provision of credible information and the suspicion of greenwashing play a major role in sustainability communication. This makes greenwashing perceptions and the perceived amount of information potential mechanisms through which storytelling affects consumer reactions. The literature on greenwashing distinguishes visual and verbal greenwashing cues (Parguel et al., 2015). Main examples are vague, unverifiable statements as well as the color green or nature imagery if used without substantial sustainability information (Parguel et al., 2015).

These greenwashing elements are closely related to the use of storytelling without factual information. The story works with visual cues and conveys brand sustainability through the characters and storyline in a vague way without substantive evidence (van Laer et al., 2014). People are generally aware that some brands engage in greenwashing and thus manipulate

consumers (Chen & Chang, 2013). If such a manipulative intent is suspected through the use of storytelling and the impression of greenwashing is conveyed, the positive effect of the story disappears (Wentzel et al., 2010). Objectively, it is also apparent that the story conveys less information than a factual advertisement. Due to the characteristics of sustainability communication, this can be negative if consumers also perceive the amount of information to be lower (Leonidou & Skarmeas, 2017). Summarizing the effects regarding the mediation hypotheses, we posit:

H2 *The negative effect of a narrative sustainability ad without factual information on a) attitude toward the ad, b) ad credibility, and c) brand authenticity will be mediated by increased greenwashing perceptions and a lower perceived amount of information.*

5.3 Experimental study

5.3.1 Design, stimuli, procedure, and measures

The experimental study followed a 3 (ad style: factual, narrative, hybrid) x 4 (brand: Rewe, Alnatura, Nivea, Weleda) between-subjects design and was conducted with a sample of young German consumers. As the communication of narrative advertising through social media increases, the ad videos were implemented in the style of Instagram Reels and presented to participants aged under 35 as the platforms' target group (Dessart & Standaert, 2023). The brands were chosen because they are well-known in Germany and represent different product categories (i.e., food and cosmetics). A pretest (N = 68, M_{age} = 38.22, 47.4% female) was conducted to determine whether the brands are perceived as having different levels of sustainability by consumers. Participants who were familiar with the brands (values above two on a seven-point scale) rated the question "How sustainable do you perceive *brand X* to be?" (*1 = not sustainable at all – 7 = very sustainable*).

T-tests revealed that for both product categories one brand is perceived as significantly more sustainable than the other (food: n = 68, M_{Rewe} = 4.15, $M_{Alnatura}$ = 5.41, t = 7.04, p <. 001; cosmetics: n = 65, M_{Nivea} = 3.45, M_{Weleda} = 4.86, t = 6.56, p < .001). Covering both less and more sustainably perceived brands is important to enable more generalizable recommendations for brands of different degrees of sustainability.

As stimuli, we created videos for each of the brands promoting their sustainability. The factual ad videos begin with a statement/slogan that the brand is sustainable, followed by three facts on the brands' sustainability efforts, e.g., the share of organic products in the assortment,

the use of renewable energies, or social projects in which the brand is engaged. It then concludes with the brand logo and slogan. When creating the narrative advertising video, we oriented closely to the literature on storytelling in order to integrate all relevant elements of a narrative. These are a plot, one or more characters, climax, as well as an outcome (van Laer et al., 2014). We maintained a consistent narrative structure across all brands and only adapted to the context of food consumption or cosmetics by incorporating industry-specific information. Each story started with the introduction of a consumer as character and an activity they enjoy that is limited by environmental issues and climate change (e.g., a preference for cooking with fresh, home-grown vegetables that are increasingly withering due to rising temperatures in recent years). This problem creates a certain tension as climax of the story. The brand then enters the story, emerging as a hero who addresses the sustainability issues and therefore resolving the created tension. In the hybrid ad version, in the final section this narrative approach was supplemented with the sustainability information presented in the factual ad version.

We generated a sample of 609 consumers (M_{age} = 24.88, 60.9% female), while data collection took part in several waves for each brand. The participants were randomly assigned to one of the three conditions. We measured attitude toward the ad using three items, anchored by *very unfavorable/very favorable*, *very bad/very good*, and *very negative/very positive* (α =.92; Escalas, 2004). The employed scale for skepticism toward the ad was anchored by *unbelievable/believable*, *not truthful/truthful*, and *deceptive/nondeceptive* (α =.85; Kirmani & Zhu, 2007). To measure brand authenticity, we used seven items proposed by Morhart et al. (2015) (α = .92; (1) *a brand that will not betray you*; (2) *a brand that accomplished its value promise*; (3) *an honest brand*; (4) *a brand that gives back to its consumers*; (5) *a brand with moral principles*; (6) *a brand true to a set of moral values*; (7) *a brand that cares about its consumers*). Perceived greenwashing was assessed with five items by Chen & Chang (2013) (α = .91; (1) *brand X misleads with words in its environmental features*; (2) *brand X misleads with visuals or graphics in its environmental features*; (3) *this ad of brand X brand possesses a green claim that is vague or seemingly unprovable*; (4) *this ad of brand x overstates or exaggerates how green it actually is*; (5) *brand X leaves out or masks important information, making its green claims sound better than they are*). For perceived amount of information, three items from Liang et al. (2022) were adapted: (1) *The ad provided a lot of information about the sustainability of brand X*; (2) *I learned a lot about the sustainability of brand X from the ad*; (3) *The ad provided a lot of useful information about the sustainability of brand X* (α = .95). As manipulation check, we used three items from Escalas et al. (2004) (α = .74; (1) *the ad told a story*; (2) *the ad had a beginning, middle, and end*; (3)

the ad showed the personal evolution of one or more characters). All scales were seven-point Likert scales (1 = low/disagree; 7 = high/agree).

5.3.2 Results

We first tested the direct effects on all three dependent variables using an ANCOVA model that includes the brand as covariate. As the brand did not interact with our hypothesized effects, we pooled the data across brands. The manipulation check indicates that participants perceived the two ad versions containing a narrative structure as a story to a greater extent than the factual ad ($M_{factual}$ = 2.81, $M_{narrative}$ = 5.20, M_{bybrid} = 4.95, F = 200.64, p < .001).

The mean values and ANOVA results for all three dependent variables are presented in Table 5-1. Pairwise comparisons via post-hoc tests reveal that the narrative ad elicits significantly worse consumer responses compared to the factual and hybrid ad versions. This supports H1a-c stating that storytelling without providing factual information elicits more negative consumer responses. The hybrid ad performs equally well as the factual ad; there are no significant differences in the three variables.

	Factual ad (n=203)	**Narrative ad (n=210)**	**Hybrid ad (n=196)**	**ANOVA results**
Attitude toward the ad	4.55_a	4.04_{ab}	4.53_b	F= 8.47, p <.001
Skepticism toward the ad	3.16_a	3.84_{ab}	3.40_b	F= 11.82, p <.001
Brand authenticity	4.07_a	3.77_{ab}	4.13_b	F= 5.73, p =.005

Note: The same subscripts in the same line indicate significant differences between the means at the 5%-significance level based on Bonferroni post-hoc test results.

Table 5-1. Means and ANCOVA results for the dependent variables in each condition.

In order to test H2a-c, which predicts the mechanism behind the negative impact of a narrative sustainability ad, we compare the narrative ad version without information to the other two groups. To do so, we employed a mediation model (PROCESS macro for SPSS, model 4; Hayes, 2022).

We found a positive effect of a narrative ad without factual information on the mediating variable perceived greenwashing (.38, p < .001) as well as a negative effect on perceived amount of information (-1.77, p < .001). The increased greenwashing perception and the lower perceived amount of information negatively impacted all three dependent variables. Furthermore, the indirect effects via perceived greenwashing on a) attitude toward the ad (-.07, CI [-.13, -.03]), b) skepticism toward the ad (.17, CI [.10, .39]), and c) brand authenticity (-.16, CI [-.63, -.37]) were significant.

Also the indirect effects via perceived amount of information on a) attitude toward the ad (-.48, CI [-.58, -.37]), b) skepticism toward the ad (.31, CI [.19, .43]), and c) brand authenticity (-.36, CI [-.46, -.28]) were significant, supporting the expected mediations postulated in H2a-c. Exemplarily for all three dependent variables, the results for attitude toward the ad are depicted in Figure 5-1.

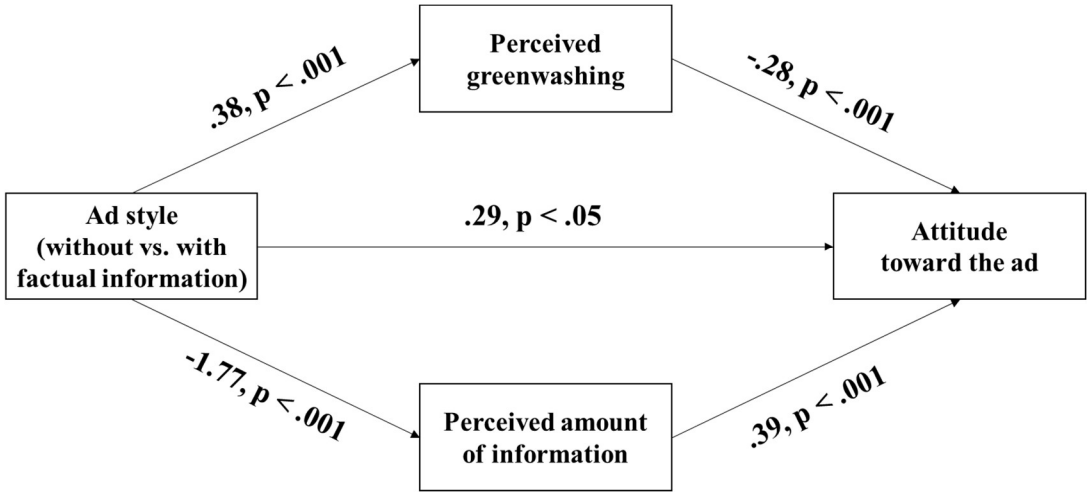

Figure 5-1. Results of the mediation analyses for the effects on attitude toward the product.

5.4 Discussion

In times of growing consumer interest in sustainability, accompanied by skepticism about the sincerity of corporate sustainability efforts, effective sustainability communication is essential from brands' perspective (Leonidou & Skarmeas, 2017). In this context, storytelling is recently recommended as a promising marketing tool (Dessart & Standaert, 2023). Although storytelling has repeatedly proven to be an effective tool (e.g., Escalas, 2004; van Laer et al., 2014), the general advertising context differs from the specific case of sustainability communication (Dessart & Standaert, 2023). Our findings demonstrate that storytelling does hold potential for sustainability communication, but the mere persuasion through a narrative is not sufficient for brands promoting their sustainability. Narrative structures can draw people into the stories and can therefore be effective in increasing the topic's relevance (Dessart & Standaert, 2023). However, in order for a company or brand to be perceived as a sustainable actor in a corporate ad story, factual information should be provided as a proof of credibility (Chen & Chang, 2013; Kim et al., 2022). The study is one of the first to take an empirical approach to storytelling in sustainability communication (Huang & Guo, 2021; Kim et al.,

2022) and, as far as we know, there are as yet no empirical findings on narrative structures that introduce the brand as sustainable actor.

It is apparent that skepticism toward sustainability information among consumers has grown considerably (Leonidou & Skarmeas, 2017). Also, due to the variety of information with which they are regularly confronted, consumers are also to some extent accustomed to sustainability being communicated through factual information (Gleim et al., 2013; Leonidou & Skarmeas, 2017). In addition to narrative persuasion and the activation of people through stories, information that can be processed analytically therefore also seems to be necessary for a convincing sustainable advertisement. Factual information appears to be relevant not only for ad-related constructs such as the attitude toward the ad, but also for the longer-term perception of the brand (i.e., brand authenticity). Therefore, storytelling is still a promising tool for communicating brand-related sustainability, but more research is needed to ensure an effective use (Dessart & Standaert, 2023). Research questions regarding the characteristics of certain narrative elements, the medium through which the story is conveyed or the interplay of factual information and narratives should be investigated more thoroughly.

From a practical perspective, storytelling should be used with caution in sustainability communication. In this context, this form of communication entails risks and can potentially lead to lasting consequences such as skepticism or a lower perceived brand authenticity. Especially in the area of sustainability communication, where much depends on customer trust, narrative approaches should be carefully considered and tested and, in case of doubt, conveying factual information may be the safer choice.

However, our research also includes limitations. We chose young consumers as one of the major target groups for sustainability communication. These consumers, however, generally know more about sustainability and are often more skeptical about sustainable marketing (Atkinson & Rosenthal, 2014). It would therefore be worthwhile testing our hypotheses in a representative sample. In addition, only one specific form of narrative structure was tested, so that the results can be further replicated and generalized with other stimuli. It would be particularly interesting to see how the hybrid version of the ad, which contained both a narrative structure and factual information, could be further developed to improve its performance compared to the factual ad.

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6. When mindful consumption meets short food supply chains: Empirical evidence on how higher-level motivations influence consumers

Abstract

Consumers have begun questioning the global agri-food system, seeking more sustainable alternatives to the conventional mode of food supply. Alternative food networks have been spreading globally, the predominant form of which is known as short food supply chains (SFSCs). The goal of this article is to advance our understanding of the motivations affecting consumer behavior towards SFSCs. To reach this goal, we drew from the mindful and sustainable consumption literature, and conceptualized an integrative framework of three higher-level motivations (i.e., health consciousness, ethical identity, and environmental consciousness) to determine what drives current (i.e., self-reported purchase behavior at the present time) and intended future SFSC purchases (i.e., self-reported intended behavior in the near future).We supplemented our model with the concept of domestic provenance importance, which reflects the importance consumers attach to familiar sources and adjacent spatial conditions of production, as well as with consumers' attitude change towards SFSCs due to the COVID-19 pandemic. Based on a survey sample of 1,299 food consumers in three European countries (i.e., Germany, Hungary, Spain), we found that environmental consciousness had a strong effect on current purchase behavior. In contrast, ethical identity significantly influenced intended future purchase behavior. Health consciousness appeared to have only weak effects. Moreover, domestic provenance importance and attitude change towards SFSCs as a result of the COVID-19 pandemic exhibited a somewhat robust effect overall. Our study contributes to the burgeoning SFSC literature by documenting the differential influence of higher-level motivations on current and future purchase behavior, offering valuable insights to food policymakers and practitioners in quest of stimulating transformative action in food production and consumption.

Keywords: higher-level motivations, mindful consumption, sustainable consumption, short food supply chains

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Current status of the paper: This paper is published in *Sustainable Production and Consumption* (IF: 12.1) as: Benos, T., Burkert, M., Hüttl-Maack, V., & Petropoulou, E. (2022). When mindful consumption meets short food supply chains: Empirical evidence on how higher-level motivations influence consumers. *Sustainable Production and Consumption, 33*, 520–530. https://doi.org/10.1016/j.spc.2022.07.028

The formatting of this paper has been adjusted to fit the formatting of this dissertation.

6.1 Introduction

Humans have unlimited needs, but the planet has a limited capacity to satisfy them. People are currently consuming more resources than ever, while waste and pollution keep mounting. This is particularly evident in the agri-food sector, where, for instance, a food loss of 13.8 % in supply chains is recorded every year, coupled with an annual economic loss of $400 billion (United Nations, 2021). In fact, the conventional food systems are largely unsustainable from an economic, social, and environmental standpoint, being highly vulnerable to the impacts of environmental degradation, such as the increasing recurrence of natural disasters and zoonotic diseases (Food and Agriculture Organization of the United Nations, 2021). Lately, the coronavirus crisis further underscored the importance of the interrelations between our health, ecosystems, supply chains, and consumption patterns (European Commission, 2020).

Not unexpectedly, consumers have begun questioning the global agri-food system, seeking alternatives to the conventional, industrial mode of food supply (González-Azcárate et al., 2021). Food producers, often in conjunction with consumers, have formed alternative food networks, which attempt to change the way people produce and consume (Bernardi & Tirabeni, 2018; Jarzębowski et al., 2020; Paciarotti & Torregiani, 2021). The predominant form of these alternative networks is also known as Short Food Supply Chains (SFSCs), which, in essence, consists of food supply arrangements characterized by a limited number of economic operators and geographical proximity between producers and consumers (Vittersø et al., 2019). Although SFSCs typically have a local orientation, they have been spreading globally, providing manifold environmental, economic, and social benefits (Elghannam et al., 2019).

Actually, SFSCs have been shown to enable sustainable consumption routines (O'Neill et al., 2022), boost the adoption of sustainable agricultural practices (Mundler & Laughrea, 2016), generate employment in rural areas (Jarzębowski et al., 2020), and enhance farmers' work satisfaction and client appreciation (Mundler & Jean-Gagnon, 2020), among others.

Research on SFSCs and local food has experienced remarkable growth during recent years (González-Azcárate et al., 2021), predominantly scholarly work on consumer attitudes and behavior. Notably, numerous studies have explored drivers and barriers of intended or actual consumer behavior towards SFSCs (e.g., Giampietri et al., 2016; Lombardi et al., 2015) or local food (e.g., Cranfield et al., 2012; Jensen et al., 2019). Undoubtedly, most of these studies have sought to understand why (or why not) consumers buy local food or purchase from SFSCs, and several have identified consumer segments marked by divergent motives. Despite the wealth of extant research, most studies have examined certain aspects or special types of

SFSCs, while less attention has been paid to consumer motivations (i.e., higher-level) that transcend practical aspects (e.g., price, convenience) and truly distinguish SFSCs from conventional long chains (Luo et al., 2022). Hence, the research perspectives have been mostly narrow, and a comprehensive investigation of consumer motivations towards SFSCs is missing. This research gap persists because, although studies have examined the influence of distinct higher-level motivations (e.g., environmental care), only values-related scholarly work (e.g., Cicia et al., 2021; Ditlevsen et al., 2020; Lombardi et al., 2015) has followed an integrated approach to elucidate the guiding role of higher-level factors (e.g., values as guiding principles) in a SFSC or local food context.

The principal goal of this article is to address this research gap, adopting an integrated approach of higher-level motivations to advance our knowledge of the motivations affecting consumer behavior towards SFSCs. This goal is fleshed out into the core research question of how three higher-level motivations, namely health consciousness, ethical identity, and environmental consciousness, influence current and intended future SFSC purchase behavior (with the former representing consumers' reporting about whether they shop from SFSCs at the present time, and the latter reflecting their intended buying behavior in the near future). Instead of values, our integrated approach is centered on the role of mindset in guiding and shaping consumption behavior (Sheth et al., 2011). In effect, we ground our approach on the sustainable consumption literature, which posits that sustainable consumption decisions might be induced by a mindful mindset, which in turn reflects a conscious sense of caring towards the self, the community, and the ecosystem (Lim, 2017). Additionally, two further research questions evolve around aspects that get consumers closer to alternative food networks like SFSCs. The first is the question of how domestic provenance importance impacts current and intended future buying behavior, and the second consists of the influence of an attitude change due to the COVID-19 pandemic. The former embodies consumers' growing desire to know and trust the source and spatial conditions of production (Thomé et al., 2021), and the latter mirrors the pandemic's influence on consumers' food choices (Gómez-Corona et al., 2021; Nemes et al., 2021).

To answer these research questions, we first revisit extant research, which has provided valuable insights into the various influences on local food buying or purchasing from SFSCs. Then, we build our conceptual framework based on the sustainable consumption literature and develop hypotheses. Finally, we test our presumptions based on a survey sample of 1299 food consumers in three European countries (i.e., Germany, Hungary, and Spain). Our integrated approach of simultaneously investigating the effect of three critical higher-level motivations

(i.e., health consciousness, ethical identity, and environmental consciousness) on SFSC purchases offers a fresh perspective on the role of such motivations as "guiding compasses" for food consumers and paints a more comprehensive picture of how consumer behavior towards SFSCs is affected. In addition, this approach, coupled with the robust effects of domestic provenance importance and the COVID-19- related attitude change, advance our knowledge on consumer behavior towards alternative food choices as well as the literature on sustainable and mindful consumption.

The remainder of this article is structured as follows. The second section provides the literature review, including the conceptual framework and hypotheses. The third section presents the methodology, and the fourth section the results. The fifth section discusses the results, the implications, and the limitations, and points to areas for future research. The article is rounded off with some concluding remarks.

6.2 Literature review and conceptual framework

6.2.1 Review of consumer motivations regarding SFSC purchases

In the literature, there is no single and universally accepted definition of SFSCs (Jarzębowski et al., 2020; Paciarotti & Torregiani, 2021). Similarly, no singular definition of local food exists (Jensen et al., 2019; O'Neill et al., 2022), though it is typically portrayed as food produced, sold, and consumed in a certain administrative or geographical area (Bianchi & Mortimer, 2015; Cranfield et al., 2012). Not surprisingly, SFSCs are often confounded with the concept of 'local food systems', even though the latter does not take into account the number of intermediaries involved (Vittersø et al., 2019). Of course, SFSC configurations are rich, including, among others, on-farm sales, roadside stands, farmers' markets, collective farm-owned shops, online farm sales, food box schemes, community-supported agriculture (CSA), and distribution through specialty retailers (Cicia et al., 2021; Koutsou & Sergaki, 2020; Paciarotti & Torregiani, 2021). For this study, we relied upon the definition provided in Regulation (EU) No, 1305/ 2013[7], which takes into consideration both the geographical proximity between producers and consumers as well as the social proximity between supply chain actors . In doing so, we primarily reviewed studies that explore consumer characteristics and motivations for purchases or intended purchases from SFSCs. We did consider studies on

[7] A SFSC is a "supply chain involving a limited number of economic operators, committed to co-operation, local economic development, and close geographical and social relations between producers, processors, and consumers" (p. 13).

local food, too, particularly review studies (e.g., Bentsen & Pedersen, 2021; Feldmann & Hamm, 2015) and studies where the reported outlets were, in fact, SFSCs (e.g., farmers' markets, CSA). Still, we were careful to draw the subtle distinction between SFSC-related articles and local food studies whenever the concept of "local food" was employed without any conceptual delineation or at least a description of the examined channels.

Admittedly, the influencing factors for buying SFSC products or local food identified in the literature are plentiful (Cicatiello, 2020; Feldmann & Hamm, 2015; Sacchi et al., 2022). They can be broadly summarized into three categories, namely personal background characteristics, practical aspects, and higher-level drives. The first category, albeit not necessarily the main focus of SFSC or local food studies, consists of socio-demographics, such as gender, age, education, income, and place of residence. The second category involves practical aspects related to food attributes (e.g., product quality, freshness) and other individual self-centered motives (e.g., price, convenience). Finally, the third category encompasses largely deep-rooted societal motives, such as rural support, environmental care, and connectedness with producers.

Results from studies on background characteristics influencing SFSC or local food purchases do not seem to be conclusive, even though most studies draw a picture of older, wealthier, female buyers (e.g., Bean & Sharp, 2011; Cranfield et al., 2012; Feldmann & Hamm, 2015; MacMillan Uribe et al., 2012). In terms of practical aspects, distinct drivers (and barriers) for SFSC or local food purchases have been identified, such as quality, taste, freshness, availability, and convenience (e.g., Bavorova et al., 2016; Bean & Sharp, 2011; Cicatiello, 2020; Elghannam et al., 2019; Feldmann & Hamm, 2015; Giampietri et al., 2016; Lombardi et al., 2015; Megicks et al., 2012). Consumers do not always act out of pure self-interest, however. Undeniably, everyday consumption is heavily influenced by self-centered practical aspects, such as habit, hedonism, convenience, and affordability (Wang et al., 2014), but consumers increasingly realize that their food choices have environmental, social, and economic impacts alike and, thereby, use the market as an arena for a critical interchange with the globalized agri-food system (Hashem et al., 2018). As SFSCs exemplify an alternative and rather territorialized, ethical, and ecological approach towards food products (Giampietri et al., 2016), they can be expected to help consumers meet basic, lower-level self-centered needs but, at the same time, satisfy higher-level societal needs.

Besides, SFSCs do not only meet the consumer demand of offering quality food but also provide social and environmental benefits (Jarzębowski et al., 2020). For example, on the social sustainability side, SFSCs customarily strengthen local communities' social capital through the

creation of networks that engage both farmers and consumers (Sacchi et al., 2022; Vittersø et al., 2019). Not surprisingly, several studies have found that higher-level societal factors propel consumers' proclivity to patronize SFSCs. Notably, consumers appear to highly appreciate the direct relationship and solidarity with producers (Giampietri et al., 2016; Hashem et al., 2018; Koutsou & Sergaki, 2020; Lombardi et al., 2015; Polimeni et al., 2018), and the chance to support rural economies and communities (Bean & Sharp, 2011; González-Azcárate et al., 2021). Similarly, although the environmental sustainability of some SFSC forms (e.g., on-farm sales) is often contested, given their higher environmental footprint (e.g., due to logistical inefficiency) compared to that of conventional chains (Chiffoleau & Dourian, 2020; Mancini et al., 2019), environmental concerns or pro-environmental attitudes explain consumers' tendency to favor SFSCs (Cicatiello, 2020; MacMillan Uribe et al., 2012; McEachern et al., 2010; Zepeda & Nie, 2012), or even the frequency of actual purchases (Cicia et al., 2021; Giampietri et al., 2016). Equally, numerous local food studies, especially those that adopt a political consumerism approach, have shown that the increased interest in local food reflects, among others, altruistic concerns related to environmental care or support of the local economy (Bentsen & Pedersen, 2021; Feldmann & Hamm, 2015; Jensen et al., 2019).

6.2.2 Theoretical framework, conceptual model, and hypothesis

It can be expected that SFSC clients engage in the so-called "sustainable consumption", which is a way of consumption that "allows the current generations to meet their basic needs without impoverishing future ones" (Bernardi & Tirabeni, 2018, p. 1776). Sustainable consumption is grounded on harmonizing different crucial issues, such as meeting basic needs, enhancing the quality of life, improving resource efficiency, and acting ethically (Wang et al., 2014). Previous research on sustainable consumption, in the form of organic or local food, has emphasized three higher-level motivations that are concomitant with the premises of sustainable consumption, namely health consciousness, ethical identity, and environmental consciousness (Birch et al., 2018; Hansen et al., 2018).

Higher-level motivations can be traced back to the classic Theory of Buyer Behavior by Howard and Sheth (1969), which emphasized the importance of motives as an impetus to action. According to the Theory of Buyer Behavior, there are specific, lower-level motives for purchases that are closely related to product attributes (e.g., taste for food products). However, very often, these specific motives are only indicators of more general, higher-level motivations (e.g., healthy eating). These higher-level motives "serve the important function of raising the buyers' general motivational state" (Howard & Sheth, 1969, p. 473). Stimulated by the

foundation of higher-level motives, we explore the integrated role of higher-level intangible considerations on consumer SFSC purchase behavior. As SFSCs have an elevated span related to transformative issues like the diffusion of intangible values beyond the mere offering of quality products (Bernardi & Tirabeni, 2018), we employ the theoretical lens of mindful consumption to construe the junction of sustainable consumption with SFSC purchase behavior.

So, mindful consumption is a theoretical perspective that is rather pertinent to sustainable consumption (Lim, 2017). Additionally, the three higher-level motivations of health consciousness, ethical identity, and environmental consciousness that relate to sustainable consumption also reflect the three realms that reside within mindful consumption. Mindful consumption represents a confluence of mindful mindset and mindful behavior, and the three realms inherent in a mindful mindset are the conscious sense of caring for the self, the conscious sense of caring for the community, and the conscious sense of caring for nature (Sheth et al., 2011). In essence, a mindful mindset helps consumers thoroughly consider the implications of particular consumption choices and adjust their behavior accordingly (Lim, 2017).

The first realm (i.e., the sense of care for the self) is not about consumers being merely self-centered but rather about paying attention to their well-being and the well-being of others in their social environment (Lim, 2017). It has a natural fit with health consciousness, which refers to the degree to which a person cares about their own health and the health of other close individuals (Birch et al., 2018). The second realm (i.e., the sense of care for the community) is essential for both collective and individual well-being because most people find happiness in a social context (Sheth et al., 2011). This is consistent with ethical identity and consumers' conscious ethical stance towards others, as ethical consumption choices involve societal considerations, such as concern for human welfare, fair prices, and support of local communities (Birch et al., 2018). Finally, the third realm (i.e., the sense of care for nature) is naturally compatible with environmental consciousness, as the latter captures the genuine concern for the environment and how conscious consumers are about environmental problems that require behavioral change (Hansen et al., 2018).

In our conceptual model (see Figure 6-1), guided by the three integral realms of a mindful mindset and their association with sustainable consumption, we focus on investigating the influence of the three accompanying higher-level motivations (i.e., health consciousness, ethical identity, and environmental consciousness) on SFSC purchase behavior. Past SFSC studies (i.e., Bean & Sharp, 2011; Polimeni et al., 2018) have considered the influence of all these motivations, albeit partly indirectly. That is, instead of general ethical identity, they examined consumers' concern for local farmers. Certainly, such concern reflects ethical

considerations, but one's ethical identity is broader than specific societal or altruistic concerns. Thus, to the best of our knowledge, only the study of Birch et al. (2018) has directly considered all three of them in a local food context. We employ an integrative framework of these three motivations to explore how they serve as "guiding compasses" for consumers and influence their current (i.e., self-reported purchase behavior at the present time) and intended future SFSC purchases (i.e., self-reported intended behavior in the near future). Apart from focusing on current purchasing, it was important to examine the intended future behavior since it helps to demarcate the potential market for SFSCs (González-Azcárate et al., 2021).

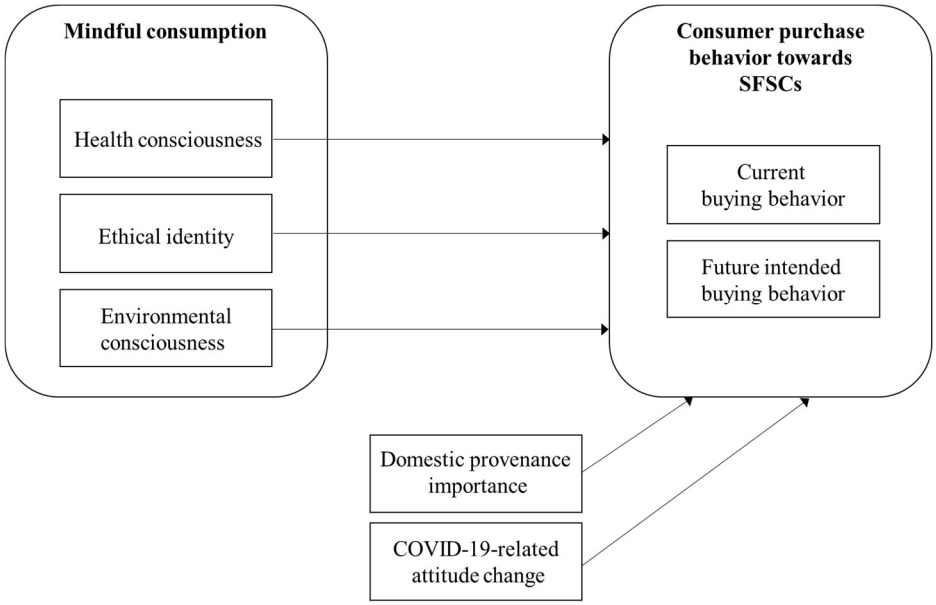

Figure 6-1. Conceptual model.

Moreover, we supplement the model with the concept of domestic provenance importance. Provenance restores the connection with nature and the origins of food, particularly for those consumers who feel alienated by conventional food systems (Reid & Rout, 2016). Domestic provenance reflects the importance consumers may attach to close, familiar sources and spatial conditions of production (e.g., producers from the same region). Finally, we consider consumers' attitude change towards SFSCs as a result of the COVID-19 pandemic. In the following paragraphs, we flesh out these considerations into hypotheses.

In a food consumption context, people concerned about health benefits for themselves or people close to them (e.g., family members) are willing to engage in actions that improve their health and well-being (Vannoppen et al., 2001). Perceived health benefits linked to

sustainable food production, in particular, are usually associated with positive behavioral intentions towards local food (Bianchi & Mortimer, 2015). SFSCs are also habitually purported to embrace sustainable farming methods and promote healthy diets (Jarzębowski et al., 2020). In addition, members of SFSCs, like consumers participating in solidarity purchase groups (Lombardi et al., 2015) and food community networks (Kurtsal et al., 2020), have been shown to care about the healthiness of food products. We, therefore, expect that health-conscious food consumers are more likely to see the health benefits of SFSC products and thereby show a preference for SFSCs. More formally:

H1 *Health consciousness positively influences (a) current and (b) intended future purchase behavior at SFSCs.*

Ethical consumption involves choices based on moral beliefs and social concerns, and is on the rise in the food sector (Birch et al., 2018). Consumers who identify themselves as ethical are more inclined to make decisions that have positive social implications and benefit others, such as buying food from a farmers' market to support local farmers or the local community (McEachern et al., 2010). Notably, SFSCs customarily give consumers the opportunity to enhance social sustainability and benefit others, like supporting local producers and rural communities (González-Azcárate et al., 2021; Koutsou & Sergaki, 2020; Mancini et al., 2019). Hence, consumers' predisposition to recognize relevant ethical issues regarding the agri-food sector and reflect on their consumption probably fuels their ethical motivation and affects their purchase behavior (Hashem et al., 2018). We hypothesize:

H2 *Ethical identity positively influences (a) current and (b) intended future purchase behavior at SFSCs.*

Environmental consciousness captures the concern for the environment (Hansen et al., 2018) and is common among local and organic food consumers (Bean & Sharp, 2011). It can also be expected that environmentally-conscious consumers might more easily discern the contributions of SFSCs to environmental sustainability, such as the diminished resource use and waste along the supply chain (Mundler & Laughrea, 2016) or the favorable animal welfare conditions (Mancini et al., 2019). We, therefore, hypothesize:

H3 *Environmental consciousness positively influences (a) current and (b) intended future purchase behavior at SFSCs.*

Apart from these three higher-level motivations, the importance that people attach to the spatial conditions of products and their origin may also motivate them to purchase from SFSCs. In the past, knowing where and by whom a food item was produced used to serve as informal quality assurance, while nowadays, formal quality assurance programs exist devoid of any spatial or personal observation of the consumer (Bean & Sharp, 2011). In recent years, people have shown a growing interest in information about the products' origin or the producers (Polimeni et al., 2018). Actually, consumers increasingly demand to know the provenance of their food (Reid & Rout, 2016). SFSCs allow consumers to comprehend the food origins (Thomé et al., 2021) and even connect with producers (Mancini et al., 2019; Sacchi et al., 2022). Domestic provenance probably further restores consumer confidence, as it helps turn "food from nowhere" (Reid & Rout, 2016) into food that each consumer knows from whom and where. Consequently, we hypothesize:

H4 *Domestic provenance importance positively influences (a) current and (b) intended future purchase behavior at SFSCs.*

Finally, since the current study was conducted during the COVID-19 crisis, it was likely that the pandemic would have exerted an influence on consumers' responses towards SFSC purchase behavior. Besides, in the early stages of the COVID-19 pandemic, consumers showed a higher interest in sourcing locally produced food (Nemes et al., 2021) and purchasing domestic drinks (e.g., domestic wine; Gastaldello et al., 2022). We, therefore, added a COVID-19-related attitude change construct to account for the pandemic's potential influence.

6.3 Methods

6.3.1 Research setting, sample, and data collection

To empirically test our conceptual framework, we drew three consumer samples from three European countries (i.e., Germany, Hungary, and Spain). We chose these countries to account for likely differences between respondents from different parts of Europe (i.e., Northern, Central, and South, respectively). Prior to data collection, the research team sought and received approval from the ethics and privacy policy committee of the Horizon 2020 SMARTCHAIN project, as the research instruments and data collection for this study were part of this project. Accordingly, a standard informed consent procedure was followed. That is, all potential respondents had to read the informed consent guidelines and fill out an informed consent sheet before taking part in the research, verifying, among others, the following: that

they were of legal age and able to provide informed consent in accordance with the laws of the country in which they resided; that they understood the research objectives, the voluntary nature of their participation, the associated terms, and that withdrawing from the research was possible at any time; and that they were aware that no personal data or any other data that could lead to their identification would be processed as part of the research.

A formal, structured questionnaire was developed to collect responses and was distributed online. Participants were recruited via the market research agency DYNATA using an existing consumer panel. The method of forward-backward translation was utilized for all three languages. Given the parameters that would be estimated (i.e., three items for each of the seven constructs, see Section 6.3.2), we targeted at least 250 responses per country, following the "N/q" hypothesis (i.e., *N* sample size in terms of the *q* parameters to be estimated; Jackson, 2003). In fact, we adhered to Bentler and Chou's (1987) rule of thumb (i.e., 5 to 10 observations per parameter). The data collection took place in the first week of November 2020, and a total of 1514 consumers took part. Each respondent was the main food purchaser in the household or at least one of the primary food purchasers. 152 cases were dropped for failing at least one of the two attention check questions we had included.3 Furthermore, we kept only responses without missing values. Hence, another 63 cases were excluded, resulting in 1299 usable responses. As we can see from Table 6-1, the sample size targets were met for each country.

Variables		Germany	Hungary	Spain
Gender	Male (%)	47.47	45.45	48.10
	Female (%)	52.53	54.55	51.90
Age	Years (mean)	49.61	47.19	46.77
Education	Non-University (%)	64.29	70.10	47.43
	University or higher (%)	35.71	29.90	52.57
Living area *(by population)*	Rural (%)	17.51	22.73	6.26
	Intermediate or urban (%)	82.49	77.27	93.74
Household size	Persons (mean)	2.18	2.77	3.00
Children at home	No (%)	76.27	66.27	55.03
	Yes (%)	23.73	33.73	44.97
Household income *(monthly)*	< 901 € (%)	7.14	54.78	6.26
	901 - 1300 € (%)	6.91	22.25	8.95
	1301 - 2000 € (%)	17.74	19.62	28.86
	> 2000 € (%)	68.21	3.35	55.93
Grocery shopping responsibility	Main purchaser (%)	74.88	57.42	72.71
	One of the main (%)	25.12	42.58	27.29
Sample size	Persons	434	418	447

Table 6-1. Socio-demographic profile of respondents.

To reduce common method variance, we adopted plenty of the procedural remedies recommended by MacKenzie and Podsakoff (2012) and Podsakoff et al. (2003). First, we placed our measures into different thematic sections across the questionnaire to make them appear unrelated. Second, we utilized dissimilar instructions across the sections and spread buffer items between the measures, but avoided complex or abstract questions. Third, we assured respondents that their answers would be used only in the context of our research and would remain anonymous. Finally, we explained that we did not intend to evaluate them and emphasized our interest in their personal views.

6.3.2 Measures

To measure most constructs, we employed established multi-item, seven-point Likert-type scales that we adjusted to our study's context. We screened all measurement scales with the aid of some academics and practitioners, and pre-tested the questionnaire with a small sample of consumers. The pre-test neither raised any concerns about the clarity of the instructions or the items nor about the questionnaire length.

We borrowed three items for each of the three motivations from Birch et al. (2018) (see Table 9-24 in the Appendix C for all constructs and measurement items). Health consciousness measured the degree to which a person was concerned about their health and the health of other individuals for whom they shop in the household. Similarly, ethical identity reflected the extent

to which a consumer was driven by ethical motives when making consumption choices. Environmental consciousness captured respondents' concern for the environment, but all three items were reversely coded. However, to avoid confusion with the interpretation of the results, we reversed the scores for the three environmental consciousness items after data collection. We measured domestic provenance importance with three items capturing the importance consumers attach to the origin of the products and knowing the producer of the product. COVID-19 attitude change towards SFSCs was assessed using three items representing the extent to which the COVID situation changed respondents' opinion about SFSCs, their intent to purchase from SFSCs, and their intent to support local producers, respectively. To measure current purchase behavior, we asked participants if they bought food from SFSCs at least occasionally ("0" = no, "1" = yes). We gave them several examples of SFSC outlets, but primarily due to length constraints, we did not differentiate between them. Finally, intended future purchase behavior at SFSCs was measured by three items, capturing respondents' intentions to purchase food from SFSCs in the future.

Even though we did not formulate any hypotheses regarding any background characteristics, we controlled for several socio-demographic variables commonly used in SFSC or local food studies. That is, we included gender, age, education, living area, household size, children at home, household income, and grocery shopping responsibility. Apart from age and household size, which were self-reported in years and the number of persons, respectively, the rest were dummy-coded (see Table 9-24 for all variables and measurement levels). We used four categories for household income, but we converted it into a dummy variable, too, by means of a median split (i.e., below or equal to the median value versus above the median value for each country). Finally, given the importance of convenience in SFSC studies, we adopted three items from Megicks et al. (2012) to assess the perceived difficulty of consumers in purchasing food from SFSCs. We named this construct "accessibility".

6.3.3 Data analysis, methods, and measure validation

All data analyses were conducted with the aid of SPSS 26 and AMOS 26. More specifically, we used SPSS 26 for the simple analyses, namely the descriptive analyses and the analyses of bivariate relationships between the constructs. We also used SPSS 26 to perform the exploratory factor analysis (EFA) for the constructs and execute the logistic regression for the current purchase behavior model. Moreover, we ran a Maximum Likelihood (ML) confirmatory factor analysis (CFA) to validate the constructs, and a structural equation

modeling (SEM) analysis for the intended future purchase behavior model. For both the CFA and SEM analyses, we used AMOS 26.

To obtain an initial evaluation of the properties of our measures and their dimensionality, we started with an EFA (principal axis factoring with oblique rotation). A seven-factor solution (variance explained = 72.23 %) was generated. Only one factor was extracted per construct (see Table 6-2). All items loaded significantly on the expected factors ($p < .001$), with loadings that ranged from .644 to .971 and weak cross-loadings on the other factors (< .2). Furthermore, scale alpha reliabilities (i.e., Cronbach's alpha) ranged from .76 to .96 (see Table 6-2). Based on these outcomes, we concluded that the construct measures could be deemed acceptable.

Construct	Item	Factor loadings	Mean	SD	Cronbach's alpha
Health consciousness (HC)					.91
	HC1	.921	5.73	1.29	
	HC2	.913	5.81	1.20	
	HC2	.801	5.60	1.33	
Ethical identity (EI)					.92
	EI1	.731	5.26	1.41	
	EI2	.952	5.21	1.47	
	EI3	.930	5.00	1.50	
Environmental consciousness (EC)					.82
	EC1	.716	3.86	2.00	
	EC2	.861	3.30	2.01	
	EC3	.761	3.40	1.92	
Accessibility (Acc)					.76
	Acc1	.822	4.49	1.67	
	Acc2	.702	4.36	1.64	
	Acc3	.644	4.39	1.74	
Domestic provenance importance (DPI)					.87
	DPI1	.707	4.91	1.55	
	DPI2	.971	5.09	1.55	
	DPI3	.662	5.30	1.49	
COVID-19 attitude change towards SFSCs (CAt)					.88
	CAt1	.847	4.89	1.22	
	CAt2	.911	4.71	1.23	
	CAt3	.751	5.07	1.26	
Purchase intentions (PI)					.96
	PI1	.915	5.16	1.48	
	PI2	.964	5.09	1.51	
	PI3	.902	5.26	1.47	

Note: Principal axis factoring with oblique rotation; Total variance explained = 72.23%; KMO = .874; Bartlett's test χ^2 = 19,000.20, df = 210, $p < 0.001$; N = 1,299.

Table 6-2. Constructs, observable items, factor loadings, and scale reliability.

We then performed a CFA to verify the EFA results and find evidence for our measures' construct validity. The model fit was evaluated with the aid of the chi-square (χ^2) and degrees of freedom as well as with a set of indices suggested by Hu and Bentler (1999): the Comparative Fit Index (CFI), the Incremental Fit Index (IFI), the Non-normed Fit Index (NNFI), the Standardized Root Mean Square Residual (SRMR), and the Root Mean Squared Error of Approximation (RMSEA). All fit measures were in line with recommended benchmarks: χ^2= 627.322 (df = 168), p = .00; CFI = .98; IFI = .98; NNFI = .97; SRMR = .042; RMSEA = .046. Further, average variance extracted (AVE; Fornell & Larcker, 1981)was used

to assess convergent validity. All AVEs were > .50, securing convergent validity for all constructs (see Table 6-3). Moreover, the distinction of the constructs was evident, as Fornell and Larcker's (1981) discriminant validity test, which suggests that, for any pair of constructs, their correlation coefficient should be smaller than the square root of the individual AVEs, was confirmed (see Table 6-3).

Constructs	Mean	SD	AVE	SCR	Acc	HC	EI	EC	SpaP	CAt	PI
Acc	4.41	1.39	.52	.77	*.72*						
HC	5.71	1.18	.78	.92	.02	*.88*					
EI	5.16	1.35	.79	.89	.03	.58**	*.92*				
EC	3.51	1.70	.60	.86	.10*	.07*	.18**	*.82*			
DPI	5.10	1.36	.69	.87	-.04	.47**	.54**	.11*	*.83*		
CAt	4.92	1.09	.71	.88	-.05	.32**	.40**	-.01	.46**	*.84*	
PI	5.17	1.42	.88	.96	-.01	.36**	.49**	.03	.55**	.62**	*.94*

Note: Acc = accessibility; HM = health motivation; EI = ethical identity; EC = environmental consciousness; DPI = domestic provenance importance; CAt = COVID-19 attitude change towards SFSCs; PI = purchase intentions; AVE = average variance extracted; SCR = scale composite reliability; square roots of AVE are given on the diagonal (in italics); **Significant at the 1% level; *Significant at the 5% level.

Table 6-3. Means, standard deviations, and bivariate correlations.

6.4 Results

To test the hypotheses regarding current buying behavior, we performed binary logistic regression. We ran three models, one for each country (see Table 6-4). The model fit was acceptable for all three countries (i.e., Nagelkerke R^2 = .351, N = 434, for the German sample; Nagelkerke R^2 = 0.232, N = 418, for the Hungarian sample; Nagelkerke R^2 = .253, N = 447, for the Spanish sample).

	Germany			Hungary			Spain		
Variables	*B*	exp. *β*	sig.	*B*	exp. *β*	sig.	*B*	exp. *β*	sig.
Control variables									
Gender	-.24	.78	.494	.32	1.37	.215	-.17	.84	.479
Age	.01	1.01	.237	.01	1.01	.175	-.01	.99	.579
Education	.14	1.15	.701	-.14	.87	.624	.31	.37	.202
Living area	-.12	.87	.773	.12	1.13	.676	.27	1.31	.554
Household size	-.29	.74	.167	.08	1.09	.512	-.17	.84	.209
Children at home	.84	2.32	.090	.51	1.67	.131	.34	1.40	.244
Household income	.94	2.56	.022	.46	1.59	.086	.21	1.24	.405
Grocery shopping responsibility	.58	1.79	.143	.22	1.25	.404	.02	1.02	.941
Accessibility	-.11	.89	.364	-.17	.84	.091	-.37	.69	.000
Predictors									
Health consciousness	.06	1.07	.667	.33	1.39	.006	-.01	.99	.961
Ethical identity	-.02	.98	.866	.04	1.04	.755	.02	1.02	.902
Environmental consciousness	-.34	.71	.002	-.15	.86	.056	-.29	.75	.000
Domestic provenance importance	.45	1.57	.003	.07	1.07	.471	.38	1.47	.001
COVID-19 attitude change towards SFSCs	1.11	3.03	.000	.57	1.77	.000	.56	1.75	.000
N	434			418			447		
Nagelkerke R^2	.351			.232			.253		

Table 6-4. Results of binary logistic regression analysis predicting current purchase behavior.

Based on the model estimates, health consciousness only had a significant effect on current buying behavior in the Hungarian sample (i.e., $p < .01$), offering partial support to H1a. Ethical identity had no influence in any of the samples, offering no support to H2a. Strikingly, environmental consciousness had a strong effect in the German and Spanish samples (i.e., $p < .01$ and $p < 0.001$, respectively), and marginal influence in the Hungarian sample (i.e., $p = .056$), offering almost full support to H3a. Moreover, in partial support of H4a, domestic provenance importance had a strong effect in the German and Spanish samples (i.e., $p < .01$), but no influence in the Hungarian sample. Furthermore, the influence of COVID-19 attitude change towards SFSCs turned out to be particularly strong (i.e., $p < .001$ in all samples). Finally, of the control variables, only household income in the German sample (i.e., $p < .05$) and accessibility in the Spanish sample (i.e., $p < .001$) had a significant effect.

Next, to assess the hypotheses regarding intended future buying behavior, we estimated the structural model (see Table 6-5). In doing so, we carried out three structural equation modeling (SEM) analyses. To account for the control variables, we added direct paths from each of them to the dependent variable. We also added current behavior as a control variable. Not unexpectedly, current behavior had a strong influence in all countries ($\beta = .11$, $p < .001$; $\beta = .20$, $p < .001$; $\beta = .17$, $p < .001$). Out of the other control variables, household size exhibited an influence in the German sample ($\beta = .08$, $p < .05$), education in the Hungarian sample

(β = .08, p < .05), and children at home in the Hungarian and the Spanish samples (β = 0.09, p < .05; β = .09, p < .05). Interestingly, in all samples, neither health consciousness nor environmental consciousness had a significant effect. Hence, H1b and H3b were not supported. In contrast, in full support of H2b, ethical identity had a significant effect in all countries (β = .26, p < .001; β = .12, p < .05; β = .22, p < .001). Likewise, in full support of H4b, domestic provenance importance had a strong influence in all samples (β = .35, p < .001; β = .28, p < .001; β = .20, p < .001). Finally, once again, the influence of COVID-19 attitude change towards SFSCs proved to be solid (β = .32, p < .001; β = 0.44, p < .001; β = .40, p < .001).

	Germany		**Hungary**		**Spain**	
Variables	Std. β	sig.	Std. β	sig.	Std. β	sig.
Control variables						
Gender	.01	.779	-.01	.787	.04	.261
Age	-.05	.110	.01	.871	.00	.948
Education	-.03	.289	.08	.031	-.02	.667
Living area	.05	.118	-.02	.550	.01	.764
Household size	.08	.015	-.03	.451	-.01	.845
Children at home	-.02	.602	.09	.022	.09	.012
Household income	.00	.926	-.03	.429	.07	.084
Grocery shopping responsibility	-.04	.194	-.02	.614	.04	.289
Accessibility	-.01	.835	.05	.289	.08	.078
Actual behavior	.11	.000	.20	.000	.17	.000
Predictors						
Health consciousness	-.02	.600	-.04	.350	-.06	.345
Ethical identity	.26	.000	.12	.023	.22	.001
Environmental consciousness	-.04	.317	.02	.599	-.03	.534
Domestic provenance importance	.35	.000	.28	.000	.20	.000
COVID-19 attitude change towards SFSCs	.32	.000	.44	.000	.40	.000
N	434		418		447	
Adjusted R^2	.578		.462		.430	

Table 6-5. SEM results predicting intended future purchase behavior.

6.5 Discussion

The results of this study provide important insights into how higher motivations impact current and intended future behavior towards SFSCs. Interestingly, the effects of these motivations on current behavior vis-à-vis intended future behavior are differential. Environmental consciousness was revealed as the major driver of current SFSC purchases, for which ethical identity played no role. The reverse relationship emerged for consumers' intended purchase behavior in the future, where ethical identity turned out as the main driver, whereas environmental consciousness was not a contributing factor.

In essence, a positive influence of environmental consciousness on current SFSC purchase behavior is consistent with recent studies. For example, environmental commitment has been shown to be a key motivating factor for consumers of box schemes in England and

France (Brown et al., 2009) or farmers' markets in the US (Zepeda & Nie, 2012), while the search for environmentally sustainable products is decisive for SFSC participation in Italy and Germany (Blättel-Mink et al., 2017; Cicatiello, 2020). At the same time, studies identifying ethical motivations as drivers of SFSC purchases have shown that the social sustainability of SFSCs drives consumption of local produce in England (McEachern et al., 2010; Megicks et al., 2012), while ethical identity increases purchase frequency at farmers' markets in the U.S. and Germany (Blättel-Mink et al., 2017; Conner et al., 2010). Strikingly, the understanding of the relative importance of environmental consciousness compared to ethical identity is fragmented and ambiguous (Bean & Sharp, 2011; Birch et al., 2018; Blättel-Mink et al., 2017). Also, to the best of our knowledge, no study has examined the effects of environmental consciousness and ethical identity on both current and intended future behavior, let alone identified differences in their influence.

From a macro perspective, our differential findings between current and intended future purchases presumably mirror the global development of the movement towards sustainability. Environmental aspects have been part of global discussions at least since the 1970s, when the first UN Earth Summit was held in Stockholm[8], with a focus on countering pollution and preventing climate change. Over the decades, a strong societal awareness has grown, engendering consumers who - if interested and financially secure - very well care about the environment and know how to take action (Barone et al., 2020). Therefore, our finding that consumers' environmental consciousness shapes their current purchase behavior might not be surprising. Accordingly, the effect might be weaker (i.e., marginally significant) in Hungary because the disposable income is lower compared to the other countries considered (see Table 6-1 and Eurostat, 2021), increasing the financial pressure on households while leaving less capacity for eco-friendly behavior.

On the contrary, the consideration of ethical aspects as part of a movement towards sustainability seems to be less clear for many people. Although caring for ethical issues is, of course, not new, considering it a pillar of sustainability may be less obvious than for environmental aspects. Besides, recent studies (e.g., Barone et al., 2020; van Loo et al., 2017) have shown that consumers associate sustainability mainly with the environmental dimension rather than with social aspects. On a macro level, this is also reflected by the fact that the UN Sustainable Development Goals, which are based on a more holistic understanding of sustainability incorporating many social and ethical aspects, were only adopted by the member states in 2015. As a consequence, consumers' current behavior might not be driven already by

[8] https://www.un.org/en/chronicle/article/stockholm-kyoto-brief-history-climate-change

ethical concerns as much as by environmental concerns. However, consumers indeed seem to feel the need to engage with this in the future. In addition, this may be coupled with the feeling that they have already done a lot to protect the environment, explaining why their environmental consciousness does not drive intended future purchases.

In prior research, health has been identified as a key factor to attracting consumers to SFSCs (González-Azcárate et al., 2021; Kurtsal et al., 2020; Vannoppen et al., 2001; Zepeda & Nie, 2012). In our study, the third higher-level motivation, health consciousness, seems to play no major role in driving consumers' purchase behavior of SFSCs. Nevertheless, there is one exception: it affected current purchases in the Hungarian sample. In line with the results for environmental consciousness, it is likely that, due to financial constraints, Hungarian consumers consider first the benefits of SFSCs to their households rather than to others. In general, though, health consciousness's lack of influence might corroborate extant studies' finding that perceived health benefits drive SFSCs purchases when tied to organic production (Hashem et al., 2018; Zepeda & Nie, 2012).

Finally, of no less interest are our findings that domestic provenance importance and the attitude change due to the COVID-19 situation have a strong positive influence on current and intended future behavior. The effect of domestic provenance importance confirms the rising consumer interest in the products' origin and the producers (Polimeni et al., 2018), while COVID-19s influence reflects the exposure of people all over the world to the perils of the pandemic (Gastaldello et al., 2022; Nemes et al., 2021).

6.5.1 Theoretical implications

Following an integrated approach to investigate the three most important higher-level motivations for consumers' buying behavior towards SFSCs, this study contributes to the literature on sustainable and mindful consumption as well as the literature on consumer behavior towards alternative food choices. The motivational power of health consciousness, environmental consciousness, and ethical identity has been conceptualized based on the literature on sustainable and mindful consumption (Birch et al., 2018; Lim, 2017; Sheth et al., 2011). It has been argued that these factors have the potential to really explain why consumers patronage SFSCs while looking beyond practical aspects and obvious product characteristics, such as quality and taste. SFSCs can satisfy the need for a more meaningful and careful consumption with benefits for consumers, producers, and society as a whole. Our results confirm those of previous work (e.g., Birch et al., 2018; Cicia et al., 2021; Giampietri et al., 2016; González-Azcárate et al., 2021) and extend them by revealing a novel pattern with

different higher-level motivations being the prevalent drivers of current and intended future behavior, respectively. On a broader level, our findings enrich the literature on local and SFSC food purchases by unraveling the impact of higher-level constructs that are deeply rooted in consumers' mindsets, probably serving as "guiding compasses", similar to consumers' value orientations that serve as guiding principles (Ditlevsen et al., 2020; Lombardi et al., 2015).

Another key contribution is the divergence of the motivational factors regarding current and intended future behavior. Researchers can benefit from these findings when interpreting and comparing results on sustainable food consumption from different studies with regard to different dependent variables. We know from various studies in the field of alternative food products that consumers' attitudes do not always translate into behavior (e.g., Feldmann & Hamm, 2015). Our findings extend these studies by underscoring that the forces driving current behavior do not necessarily give an indication of those driving consumers' intended behavior in the future. So, behavioral patterns observed in the present may not predict future behavior. The third contribution consists of underlining the strong impact of domestic provenance importance, which represents the importance consumers attach to familiar sources and adjacent spatial conditions of production (Thomé et al., 2021). We contribute to the SFSC and local food literature since our data confirm that consumers seek the connection and proximity to production and the producers for both current and intended future purchase behavior. This mirrors the trend that consumers are increasingly interested in the origin of their food with regard to who produced it and where it was produced (e.g., Jensen et al., 2019; Megicks et al., 2012). In addition, this finding supports the strong association of SFSCs with the localness of food.

Finally, as the pandemic has radically affected consumption and consumers (Nemes et al., 2021), the current study also covers the impact of COVID-19 on consumer behavior towards SFSCs, offering fresh evidence about its consequences. Recent research showed that the pandemic triggered consumer fears and a loss of trust in conventional supply chains, which in turn stimulated local food purchases and support for domestic products (Gastaldello et al., 2022; Gómez-Corona et al., 2021). In this respect, SFSCs could potentially provide a sense of security. We, indeed, found an improvement in the attitude towards SFSCs elicited by the special situation of COVID-19. This positive attitude change considerably affected both consumers' current and intended future purchases.

6.5.2 Practical implications

Our findings offer key insights for all SFSC stakeholders, although the most important implications may relate to producers and policymakers. The differential effects of higher-level motivations on current and intended future behavior urge caution when inferring future customer behavior from current states. Producers and food managers need to be aware of this divergence, as drivers of current SFSC purchases alone may lead to the wrong conclusions when identifying future trends and potential new customer segments (González-Azcárate et al., 2021). Next, in their communication, producers may appeal to consumers' need for ecologically and socially sustainable consumption. Especially the social benefits can be explained in detail and with respect to measures that can be taken. For example, advertisements highlighting the environmental and social benefits of SFSCs and SFSC products can be used to draw consumers' attention to these benefits beyond the more product-immanent aspects.

Additionally, due to the high importance of domestic provenance importance, policymakers, in conjunction with producers, may develop regional marks or labels that help consumers identify products from SFSCs. Finally, considering that the pandemic raised awareness of the complexity and vulnerability of our modern global supply chains, which were disrupted during the restrictions (European Commission, 2020), producers and policymakers might run communication campaigns to emphasize that SFSCs can galvanize the sustainable transition of the agri-food system. Although the pandemic might have served as a catalyst for more sustainable consumption behavior in general, supportive marketing and policy measures will probably be indispensable for fostering such behavior (Nemes et al., 2021).

6.5.3 Limitations and future research suggestions

We applied quite a few of the procedural remedies put forward by MacKenzie and Podsakoff (2012) and Podsakoff et al. (2003) to free our measures of methodological artifacts. However, it is likely that the latter have exercised some influence. Longitudinal designs could be considered that would at least allow researchers to temporally separate the examination of motives from that of buying behavior (see also Luo et al., 2022). In fact, such designs would also help scholars determine the long-term path of buying behavior and verify whether ethical identity fulfills the promise of stimulating actual SFSC purchases in the future.

In addition, we cannot rule out that the subjective nature of our outcome measures (i.e., self-reported measures of current and intended future behavior) as well as their differential evaluation (i.e., a binary variable for current behavior vis-à-vis a three-item construct for intended future behavior) might have affected the accuracy of our results. Future research might

consider Biasini et al. 's (2021) recommendation to use more precise and objective measures in prospective study designs (e.g., asking consumers to collect the receipts of actual food purchases to calculate purchase volumes in a diary-like manner) in order to obtain more reliable predictive analyses of actual purchase behavior. In a similar vein, our sample size choices might not be optimal. Although our sample size targets based on the "N/q" hypothesis, for which some support has been found (Jackson, 2003) were met, we did not try to reflect the varying population sizes of the sample countries. Hence, future studies might consider more elaborate sample-size planning to determine the appropriate sample sizes (e.g., take different model features into ex-ante consideration), particularly when they seek to model multivariate relations or generate samples representative of their target regions.

Furthermore, our study was not designed to distinguish between different SFSC configurations. Our choice not to examine different outlets separately was stirred by length constraints and prevailing empirical reflections. In other words, the discrete examination of so many different outlets would have probably induced respondent fatigue, while the vast majority of extant studies have either not performed a separate investigation or have only examined one channel. Still, it may be fruitful to vary the foci of SFSC outlets, as research (e.g., Bavorova et al., 2016) has also shown that diverse aspects might influence consumers' purchase frequency from different SFSC outlets.

6.6 Conclusion

Food consumption is an integral part of everyday consumption, but consumers are ever more aware that their choices have long-lasting environmental, social, and economic implications. The conventional food systems have become largely unsustainable, and consumers increasingly seek alternative networks of food provision like the SFSCs, which have a broader scope than mainstream channels, even related to the sustainable transition of the agri-food system. Our research shows that higher-level motivations anchored in a mindful mindset and concomitant with the premises of sustainable consumption may serve as "guiding compasses" for consumers' buying behavior towards SFSCs. Notably, environmental consciousness seems to drive actual purchase behavior, while ethical identity seems to propel intended future purchase behavior. In addition, as conventional food systems do not accommodate any spatial or personal observation of consumers, the latter progressively attach importance to domestic provenance, which helps turn food from nowhere to food that each consumer knows from whom and where. Our research confirms that domestic provenance importance increases consumer interest in the food origins and boosts SFSC preference. Finally,

our research shows that the impact of the pandemic on consumer behavior towards SFSCs has been positive. Regardless of the circumstances or the recent favorable conditions, SFSC practitioners and policymakers need to take initiatives if they wish to provide fertile ground for alternative networks like SFSCs.

6.7 References

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7. Discussion and conclusion

Based on the assumption that consumers' sustainability perceptions represent a key influencing factor for sustainable behavior (Mothersbaugh et al., 2020; Thøgersen, 2023), the purpose of this dissertation was to improve the understanding of consumers' sustainability perceptions. As previous research has not thoroughly focused on examining the construct, its drivers, and consequences, the dissertation combined both explorative and explanatory approaches. The specific contributions of the five research papers have been outlined in the respective chapters. This chapter discusses the overall findings and contributions of the dissertation in the context of the research questions derived in Chapter 1.

Table 7-1. Research questions and key findings of this dissertation.

Research question		Key findings of this dissertation
RQ1	Which aspects shape consumers' sustainability perceptions and how do they affect subsequent consumer responses?	- Various aspects that relate to the TBL definition of sustainability but also extend beyond it shape consumers' brand sustainability perceptions *(Paper 1)* - Consumer-relevant aspects are multifaceted, so that a mere use of the TBL definition fails to capture consumer perceptions comprehensively *(Paper 1)* - Holistic sustainability information shapes and positively influences consumers' sustainability perceptions *(Paper 1 and 2)* - Positive influence of higher number of sustainability signals on sustainability perceptions if they each provide additional added value *(Paper 1)* - Recognizing concrete benefits for sustainability in sustainable product attributes positively influences sustainability perceptions *(Paper 3)* - Sustainability information that corresponds more closely with consumers' value orientations has a more positive influence on sustainability perceptions *(Paper 1)* - Product and brand sustainability perceptions important predictor of purchase-relevant variables *(Paper 1 and 2)*
RQ2	How can sustainability information be effectively communicated to increase consumers' sustainability perceptions?	- Consumers cognitively process sustainability communication content (instead of merely relying on heuristics; *Paper 1, 3, and 5)* - Effective sustainability communication needs to provide factual information (rather than only emotional/promotional elements) *(Paper 4)* - Holistic sustainability communication (covering several, complementary sustainability aspects) positively impacts consumers' sustainability perceptions *(Paper 1and 2)* - Highlighting sustainability benefits within communication strengthens consumers' sustainability perceptions *(Paper 3)* - Targeted, value-aligned sustainability communication increases chances of cognitive information processing and influences sustainability perceptions more positively *(Paper 2 and 3)*
RQ3	How do personal attitudes, values, and motivations influence consumer responses to sustainability communication and sustainable consumer behavior?	- Sustainability information increases sustainability perceptions of sustainability-oriented consumers more strongly *(Paper 1)* - Value-congruent sustainability information increases sustainability perceptions more strongly *(Paper 1 and 2)* - Sustainable value orientations favor cognitive processing of sustainability information and recognition of sustainability benefits *(Paper 3)* - Higher-level motivations serve as driver for sustainable behaviors (i.e., short supply chain purchases; *Paper 5)*

7.1 Research contributions

Consumers' individual perceptions serve as an important antecedent to their behavior (Mothersbaugh et al., 2020). In the context of sustainable consumer behavior, sustainability perceptions are thus a variable that can be situationally influenced by marketers and other actors in order to foster sustainable choices and behaviors. By addressing this construct, the dissertations contributes to the literature on sustainable behavior, sustainable communication, and marketing. This generates valuable and actionable knowledge about an important lever for promoting sustainable consumer behavior.

7.1.1 Conceptualization and role of sustainability perceptions

The introductory chapter outlined the complex nature and important role of consumers' sustainability perceptions for sustainable consumer behavior. Given its high theoretical and practical relevance, it is surprising that there is a lack of perception-driven approaches in previous research on sustainable consumption (Shultz et al., 2022).

The dissertation contributes to the conceptualization of the construct by providing interesting insights into the diverse aspects that characterize consumers' sustainability perceptions. The first research paper illustrated the diversity of relevant aspects for sustainability perceptions. These not only included environmentally-friendly or socially fair attributes and practices but also communicational aspects (such as transparency, and no greenwashing), authenticity, and the leading role of sustainable brands within sustainable development. The second paper supported the notion that consumers are aware of the diversity of sustainability-relevant aspects. Consumers recognized the extent to which sustainable products are only partially or holistically sustainable and also recognized comprehensive sustainability strategies as more sustainable. Consequently, to effectively understand and strengthen consumers' sustainability perceptions, a variety of aspects needs to be considered at an operational and communicational level (Kapitan et al., 2019).

Previous research mainly relied on the TBL definition of sustainability, consisting of the environmental, social, and economic pillar (Elkington, 1997; Shultz et al., 2022). The omission of economic aspects is thereby negligible in the field of consumer research, as economic sustainability primarily represents a managerial concern and is rarely communicated to consumers (Bangsa & Schlegelmilch, 2020). However, this dissertation reveals focusing solely on environmental and social aspects of sustainability within consumer studies as too reductive. In doing so, many aspects that are highly relevant for consumers, are neglected (Carter et al., 2021). The results of the first research paper even suggested that a larger share of

consumer-relevant aspects relates to more far-reaching aspects than mainly TBL-related aspects. This is consistent with findings on consumers' understanding of the concept of sustainability, which show that consumers define sustainability to be more than the social, environmental and economic pillar (e.g., Barone et al., 2020; Hanss & Böhm, 2012; Simpson & Radford, 2014). To better understand the consumer perspective, it is therefore beneficial to include these aspects that shape consumers' perceptions in research approaches.

In this respect, the dissertation not only contributes theoretical insights, but also presents and develops methodological approaches for the further development of the research field. In the first research paper, with the PST scale an applicable measurement instrument is developed to assess consumers' brand sustainability perceptions. It offers a standardized approach to capture the nuances of brand sustainability perceptions. This makes it a comprehensive and yet applicable, easy-to-integrate tool for survey research in different research fields.

Furthermore, the first research paper demonstrated the potential of automated text analysis as an adequate method for capturing complex consumer perceptions on a large scale (Berger et al., 2022; Humphreys & Wang, 2018). Opting for projective techniques in consumer surveys allows participants to reveal their thoughts in a spontaneous and unstructured way (Steenkamp & van Trijp, 1997). This is especially valuable to capture the (unconscious) nuances of consumer-relevant aspects for topics that are difficult to grasp for consumers (Berger et al., 2020; Roberts et al., 2014). By using automated text analysis to analyze the generated data, researchers are able to quantify the information contained in this textual data and systematically process large amounts of fuzzy consumer responses (Berger et al., 2020; Berger et al., 2022; Ma & Sun, 2020).

In addition, with FSEs, the second research paper presented a further method that is ideally suited to capturing complex attitudes and perceptions in the context of (sustainable) consumer behavior (Auspurg & Hinz, 2015; Oll et al., 2018). By employing scenarios (i.e., vignettes) that mirror complex decision-making contexts, this method enables researchers to explore the interplay of multiple relevant aspects to perception formation (Atzmüller & Steiner, 2010; Auspurg & Hinz, 2015). Thus, this method also enables the efficient collection of quantitative data that sheds light on a nuanced understanding of consumer perceptions.

Next to the conceptualization of consumers' sustainability perceptions, the dissertation contributes to the consolidation of the role of sustainability perceptions in research by providing empirical evidence for its impacts.

Several studies within the first two research papers have shown that an increase in sustainability perceptions leads to more positive consumer reactions. For example, purchase intention, relative WTP and product attitude improved as a result of increased sustainability perceptions (both on product and brand level). The first two paper also revealed that, going beyond attitudinal variables, behavioral proxies (i.e., the willingness to engage further with the brand and voluntary information seeking about a sustainable product) were positively influenced by increased brand sustainability perceptions. These empirical findings support the theoretical role of sustainability perceptions and thus strengthen the relevance of further research in this area (Thøgersen, 2023).

In general, the results on the role of consumers' sustainability perceptions are valuable as they identify it as a situationally modifiable construct that precedes consumers' decisions and behaviors (Mothersbaugh et al., 2020). It therefore represents an adjustable parameter that can be influenced by educational or promotional initiatives. As it is followed by more positive attitudes and behaviors conducive to sustainability, its investigation contributes to further sustainable development.

7.1.2 Holistic, benefit-centered, and targeted sustainability communications

The dissertation contributes to research on sustainability communications, a not yet established research field (Fischer et al., 2021). The findings of the included research papers indicated that factual, verbal sustainability information is a decisive factor in increasing consumers' sustainability perceptions (e.g., Abrahamse et al., 2007; Leonidou & Skarmeas, 2017).

The third research paper provided correlational insights into the processing of sustainability information based on consumers' sustainability-related involvement (Haws et al., 2014). The results indicated that the assumptions of the ELM also apply in the context of sustainability, in the sense that sustainability-conscious consumers with a higher ability and motivation to process sustainability information do so to a greater extent (Petty & Cacioppo, 1984).

However, the findings within this dissertation not only indicate that highly involved consumers systematically assess the provided sustainability information but that consumers in general seem to cognitively process sustainability information to at least some extent (Granato et al., 2022; Meise et al., 2014).

For example, this is illustrated in the second research paper: Participants in all experimental groups were presented with the same amount of sustainability information.

However, the participants reading holistic sustainability information (covering environmental and social aspects of several life-cycle phases) perceived the product as more sustainable than the participants seeing selective sustainability information (covering only one dimension of sustainability and one life-cycle phase). This indicates that not the mere amount of information was used as a heuristic to infer product sustainability, but that the content of the information was actually processed in order to from sustainability perceptions (Granato et al., 2022).

Accordingly, the fourth research paper on storytelling showed that sustainable brand stories are only successful if factual sustainability information is integrated alongside the story as a communication element. This research therefore demonstrated that consumers have a need for information in the context of sustainability communication (Leonidou & Skarmeas, 2017; Meise et al., 2014; White et al., 2019).

With regard to the communication of verbal sustainability information, three strategies were identified as effective within this dissertation: holistic, benefit-centered, and targeted sustainability communication.

The first strategy – holistic sustainability communication – refers to approaches that comprehensively depict the sustainable aspects of a product or brand. Companies implementing operational holistic sustainability approaches cover all three domains of the TBL throughout a product's entire life-cycle (Marcon et al., 2022; Nikolaou & Tsalis, 2018). Also, holistic brands are characterized by considering all these sustainability aspects in their entire portfolio (Carter et al., 2021). Holistic sustainability communication is therefore a type of communication that reflects such comprehensive sustainability approaches and conveys them to consumers (Viciunaite, 2022).

The second research paper related to the question whether consumers recognize holistic sustainability signaling and how this influences their product sustainability perceptions. The paper showed that holistic signal portfolios (i.e., sets of sustainability signals covering several sustainability dimensions and life-cycle phases) have a more positive impact on sustainability perceptions than selective portfolios. This is potentially because multiple congruent and complementary sustainability signals can help consumers to identify sustainable products as such (Magnier & Schoormans, 2015; Pancer et al., 2017).

However, another important insight of the present dissertation is that the principle of "the more, the better" only applies to a limited extent: Additional sustainability information only improves sustainability perceptions if the information pieces are complementary to each other and thus expand the information portfolio for a product. Simply overloading consumers with a greater amount of sustainability information with no additional informative value is not

conducive to sustainable decisions, as previous research has also shown (Chen & Chang, 2013; Granato et al., 2022). Therefore, when examining the impact of verbal sustainability claims or information, the actual information content needs to be taken into account and it cannot be universally assumed that the assumption "the more, the better" applies (Granato et al., 2022; Petty & Cacioppo, 1984).

The importance of holistic sustainability information and the positive evaluation of holistic corporate sustainability approaches is further illustrated by the first research paper. It focused on the aspects that shape consumers' sustainability perceptions on the brand level. Taking an explorative approach, it showed that if consumers can express their expectations regarding sustainable brands in a non-standardized way, the importance of a holistic sustainability approach of brands is mentioned often. For consumers, the entire value chain, the multidimensionality of sustainability, and the global impact of corporate actions are aspects that they associate with truly sustainable brands.

To pair operational holistic sustainability approaches with sustainability communication that maps their comprehensiveness can therefore be used in a targeted manner to strengthen consumers' sustainability perceptions.

Second, benefit-centered sustainable communication or marketing strategies seem to be effective to strengthen consumers' sustainability perceptions (Meise et al., 2014; White et al., 2019). Generally, benefit-centered communication strategies focus on the ability of products or brands to solve certain problems or meet specific needs (Ghiassaleh et al., 2024). In the context of sustainability, it refers to a communication strategy that emphasizes the positive environmental and social impacts of products and brands and clearly articulates how a product's or brand's attributes contribute to sustainability (Dorce et al., 2021; Golob et al., 2023).

The third research paper revealed that green consumers who have a higher motivation and ability to process sustainability information better recognize the sustainability benefits a product delivers. This, in turn, increased their sustainability perceptions of the product.

Recognizing concrete, tangible sustainability benefits thus makes it easier for consumers to form abstract perceptions of sustainability (White et al., 2019). It offers consumers concrete ways in which the product fulfills the goal of being sustainable (Meise et al., 2014). In line with this, previous research has already identified the positive effect of perceived sustainability benefits on consumer attitudes toward the product (Dorce et al., 2021; Meise et al., 2014). These findings imply that explaining sustainability benefits explicitly in sustainability communications can increase sustainability perceptions. This strategy is especially valuable for

persuading consumers with lower sustainability involvement who do not recognize complex sustainability benefits at first sight (Viciunaite, 2022).

Third, the dissertation integrates value- and attitude-based research and thus identifies targeted, value-aligned communication as effective in increasing sustainability perceptions. It represents an approach that tailors the communication to specific key audiences based on their values and priorities (Abrahamse et al., 2007; Osburg et al., 2019). In line with previous research, the dissertation shows that individual values significantly influence consumers' sustainability information processing and behavior (e.g., Haws et al., 2014; MacInnis & Mello, 2005; Magnier & Schoormans, 2015).

In this context, the fifth research paper revealed that higher-level motivations, which relate to the concept of sustainability (especially environmental consciousness and ethical identity), determine sustainable behavior patterns (i.e., purchases in short supply chains). They serve as an intrinsic motivation and drive consumers (Groot & Steg, 2008; Howard & Sheth, 1969).

Personal motivations and values not only drive consumer behavior but also determine the frame of thinking and the stronger perception of information corresponding to one's mindset (Gleim et al., 2013; Verplanken & Holland, 2002). In the context of sustainability information, the phenomenon of motivated reasoning appears to occur (Haws et al., 2014). Consumers selectively interpretate and evaluate information in a way that aligns with their values and attitudes (MacInnis & Mello, 2005). For example, the first paper showed that consumers process information in line with their attitude toward sustainability and that consumers with a sustainable attitude are more likely to perceive a sustainable brand as such. Similarly, the second research paper showed that individual value orientations (i.e., biospheric and altruistic values) influence the extent to which a piece of sustainability information is relevant to a consumers' sustainability perception. It proves that information relating to the consumers' value orientation enhances his or her sustainability perceptions more strongly. At the same time, sustainability-oriented consumers are more likely to recognize the sustainable benefits of products and therefore perceive them as more sustainable.

The impact of individual attitudes and values on the perceived relevance of sustainability information carries significant implications for tailoring effective communication strategies to diverse target groups. Targeted sustainability information is therefore an effective strategy to tailor product-related sustainability information to different consumer segments (Gleim et al., 2013; Trudel, 2019). This suggest that targeting audiences based on their values

can be valuable as a complement to the strategies of holistic and benefit-centered sustainability communication described above (Groot & Steg, 2008).

In sum, the studies show effective ways to improve consumer sustainability perceptions through information-based, convincing communication strategies. Since sustainability perceptions positively influence sustainable behavior, research on effective tools to increase sustainability perceptions indirectly contributes to the sustainable development of consumer behavior.

7.1.3 Contribution to theory

This doctoral dissertation decisively advances the theoretical knowledge on consumers' sustainability perceptions. Highlighting the major theoretical contributions, this chapter underlines how the dissertation bridges significant gaps in existing literature by pioneering a consumer-centric approach to understanding sustainability perceptions.

First, it challenges the typical top-down conceptual approach to sustainability in the realm of sustainable consumer behavior (Shultz et al., 2022). Thereby, it contributes conceptual bottom-up insights in the construct of consumers' sustainability perceptions and its role as mediator in the consumption context.

Second, while there is considerable research on visual sustainability cues (Rathee & Milfeld, 2023), communicating factual, verbal sustainability information is an underdeveloped field with no prevailing theoretical approaches (Fischer et al., 2021). Drawing on economic and psychological theories, the dissertation generates knowledge on the importance of sustainability information in the consumer context. It emphasizes the important role of factual sustainability information in a consumption area characterized by credence attributes and skepticism (Atkinson & Rosenthal, 2014; Leonidou & Skarmeas, 2017).

By applying signaling theory (Spence, 1973), the ELM (Petty & Cacioppo, 1986) and the means-end chain theory (Huber et al., 2004) to the context of sustainability communication, various forms of communication for effectively increasing sustainability communication are derived, thus expanding the theoretical understanding of sustainability communication.

Third, it also addresses the theoretical role of individual values, attitudes and motivations in the processing of sustainability information. In this context, it incorporates basic features of psychological theories such as the ELM (i.e., improved information processing with higher thematic involvement) and identifies values and attitudes as drivers of sustainability information processing (Petty & Cacioppo, 1986). However, it reveals that general assumptions cannot be applied one-to-one to the context of sustainability (Thøgersen, 2023). For example,

in sustainability communication, characterized by scientific facts and unobservable sustainability characteristics as well as skepticism, the assumption of the ELM that non-involved consumers process information heuristically cannot be applied per se. The integration of different theories to investigate sustainability perceptions within this dissertation thus emphasizes that a deliberate advancement of sustainability-specific theories is beneficial in the future.

7.2 Practical implications

Companies are facing a growing challenge in effectively communicating their sustainability initiatives to consumers (Rathee & Milfeld, 2023). Market research indicates a substantial financial and reputational potential for brands in sustainability engagement (Brand Finance, 2023). However, this potential is contingent upon effective sustainability communication that strengthens consumers' sustainability perceptions (Kapitan et al., 2019).

For many practitioners, effective, trustworthy sustainability communication is a delicate matter (Janssen et al., 2022). While effectively communicated sustainability information can create positive sustainability perceptions and consumer responses, communication strategies that are unintelligible or not trustworthy to the consumers can backfire and even enhance greenwashing perceptions (Chen & Chang, 2013; Turunen & Halme, 2021).

To ensure the credibility of sustainability communication, companies need to ensure an alignment between the operational and communicational levels (Kapitan et al., 2019). In the long run, companies do not benefit from communicating sustainability information without backing it up with substantial efforts. Applying the communication strategies identified as effective in this dissertation without implementing appropriate operational measures therefore jeopardizes the long-term reputation of the company.

When developing sustainable communication strategies, practitioners are advised to rely on empirical findings on effective sustainability communication. This is particularly important in a consumer sector characterized by a high degree of consumer skepticism (Leonidou & Skarmeas, 2017). For example, storytelling as a form of communication theoretically holds potential (Dessart & Standaert, 2023). However, the empirical investigation within this dissertation reveals that it also carries the risk of being perceived as a greenwashing attempt. When companies uninformedly select and trial sustainability communication tactics, the potential of operational sustainability initiatives can thus be undermined rapidly. This makes informed decisions extremely relevant in practice (Turunen & Halme, 2021; Viciunaite, 2022).

Based on the overall results of this dissertation, marketers are encouraged to promote their sustainability using factual, verbal sustainability information. Even the sustainability perceptions of consumers who are not highly involved in the topic of sustainable consumption are positively influenced by its provision.

In this context, holistic approaches are particularly suitable for signaling sustainability. Even if these often incur higher financial costs (Nikolaou & Tsalis, 2018), they offer actual companies the opportunity to set themselves apart from less or selectively sustainable companies and greenwashers (Vieira et al., 2023).

Additionally, marketers can guide consumers by explaining the concrete sustainability benefits of their offerings to them. Improving the comprehensibility of sustainability efforts and clearly highlighting their effects for sustainability can be especially valuable for low-involvement consumers.

The results also illustrate that meaningful sustainability communication can benefit from addressing consumers' values. Practitioners can thus profit from understanding the attitudes and values of their customer groups and orienting their sustainability communication toward these.

In addition to empirical insights into the effective design of sustainability communication, the dissertation also offers applicable methods for practice. It showcases the efficacy of automated text analysis in comprehending complex constructs from a consumer perspective (Berger et al., 2020). Brand managers can customize the methodology used in this dissertation according to their customer base to capture their customers' expectations regarding brand sustainability. Furthermore, the developed PST scale offers a convenient integration into customer satisfaction surveys.

Finally, the dissertation includes interesting insights and guidance for policymakers. The insights reveal which aspects consumers consider when forming their sustainability perceptions. This, coupled with expert knowledge, can reveal what consumers are not yet aware of (Herbes et al., 2018). Furthermore, these aspects reflect the knowledge and perceptions of consumers as a collective. Individual consumers may not be fully aware of all aspects. For this reason, the results can be the starting point for consumer education measures that encourage consumers in the long term to form their sustainability perceptions in a complex information environment.

The dissertation also points to the potential of holistic and benefits-centered sustainability and communication approaches. To strengthen their potential, it also makes sense to invest in education on holistic sustainability and sustainability benefits. If consumers are

empowered to recognize these aspects, this should have a positive impact on their sustainability perceptions and sustainable purchasing decisions.

7.3 Limitations and avenues for future research

Overall, this dissertation provides generalizable findings that can be applied in a broad context. For example, the research designs included different product categories (i.e., food, fashion, cosmetics) and different countries and cultural contexts (Thøgersen, 2023). In addition, the results were based on different methodologies, capturing diverse perspectives and minimizing methodological biases (Crane et al., 2018).

However, the generalizability is limited in that this dissertation mainly examined self-reported outcome measures which have a subjective nature and limited external validity. Across the included research papers consumer surveys represented the main data collection method, containing self-reported measures instead of measures of actual behavior. This is particularly pertinent to the positive effect of sustainability perceptions as a mediator shown in several studies. Even if previous research supports this mechanism (Chernev et al., 2021), the positive effect could partially be caused by an instrument bias (Hulland & Houston, 2021). Especially against the background of the frequently observed attitude-behavior gap (Park & Lin, 2020), it could therefore be very useful for future research to investigate actual behavioral variables to gain more realistic insights (Granato et al., 2022).

This limitation has partly been addressed by including a behavioral outcome in the first research paper. This use of a behavioral proxy and the triangulation obtained through multiple operationalizations across the research papers leads to more compelling evidence (Hulland & Houston, 2021). However, field studies in particular can advance further research on sustainability perceptions.

In addition, all studies of the dissertation were carried out at one point in time. The participants were shown certain stimuli and their sustainability perceptions were subsequently assessed within the same survey. Even though positive changes in sustainability perceptions were shown throughout all studies, it remains unclear to what extent the effects of the investigated drivers of sustainability perceptions are pertinent over time (Rust et al., 2021).

While it can be concluded that sustainability information at the point-of-sale aids in strengthening sustainability perceptions, the extent to which this information affects the reputation of a product or brand in the long term remains open. Future research could start from this point, for example through longitudinal studies, to generate further insights.

The current research specifically focuses on how sustainability information drives consumers' sustainability perceptions. It provides evidence that (verbal) sustainability information is an important communication element in the light of consumers' need for information in the sustainability context (Leonidou & Skarmeas, 2017). However, the complex information environment of sustainability communication consists not only of verbal sustainability information that needs to be cognitively processed, but also of visual cues (e.g., labels, the color green, or packaging), which tend to involve more affective information processing (Granato et al., 2022; Magnier & Schoormans, 2015; Trudel, 2019). Future research can therefore also benefit from investigating the positive effects of sustainability information on consumers' sustainability perceptions in interaction with visual cues.

In this regard, it could also be valuable to integrate neuroscience into research on consumers' sustainability perceptions to gain deeper insights into the cognitive elements underlying consumers' perceptual process (McDonald, 2018). Methods from neuroscience could reveal subconscious responses to verbal (and visual) sustainability cues to provide a more nuanced understanding of how these are processed in the brain. Thereby, future researchers could uncover implicit reactions that may not be completely expressed through self-reported measures.

The findings on consumers' sustainability perceptions could also be further developed by including research on consumer sustainability literacy. Sustainability literacy involves understanding the complex interconnections and information regarding sustainability, empowering consumers to make conscientious choices (Fernandes et al., 2020). How consumers react to sustainability stimuli, is also essentially influenced by their individual sustainability literacy (Winterich et al., 2023). However, knowledge about the current state of consumer sustainability literacy is not available (Fernandes et al., 2020).

Future research can thus identify key areas where educational interventions can be most effective, helping design targeted strategies to elevate consumers' understanding of sustainability issues and thus empower sustainability perception formation (Fernandes et al., 2020). Ultimately, a more literate consumer base is more likely to exhibit greater awareness, engagement, and alignment with sustainable practices, contributing to a more environmentally and socially responsible marketplace (e.g., Neureiter & Matthes, 2023; Winterich et al., 2023).

7.4 Conclusion

To sum up, this dissertation adds to extant literature by advancing knowledge on consumers' individual sustainability perceptions and their role in the consumption context. Keeping in mind Myers' statement that *"there is an objective reality out there, but we always view it through the lens of our beliefs and values,"* this dissertation theoretically and empirically underscores the importance of consumers' perceptions in relation to sustainability.

This work sheds light on the construct of consumer sustainability perceptions and identifies three communication tactics (i.e., holistic, benefit-centered, and targeted sustainability communication) that have the potential to effectively strengthen sustainability perceptions. Various research questions are raised and the related findings show the importance of integrating sustainability perceptions into the research context and corporate decision-making.

The key findings reveal that consumers' sustainability perceptions are diverse and multi-faceted. They include the environmental, social and economic aspects that are relevant for sustainability according to the TBL. Additionally, numerous additional aspects relating to sustainability communication, such as credibility and transparency, also play an important role.

Sustainability perceptions serve as a mediator, meaningfully predicting subsequent consumer responses. If sustainability perceptions increase as a result of sustainable product or brand characteristics or effective sustainability communication, this has a positive effect on further variables relevant to purchasing and behavior. In this context, the dissertation reveals that sustainable values and motivations impact consumers' sustainable behaviors and how they process sustainability-related information to form sustainability perceptions. Individual values and motivations determine the attention that consumers give to specific sustainability information and its importance for the formation of sustainability perceptions. As Myers describes, they also serve as lenses through which consumers see products and brands in the realm of sustainability.

The results thus further develop a previously under-researched area of sustainable consumer behavior and hopefully provide valuable theoretical and methodological guidance for integrating the consumer perspective of the objective reality of sustainability for future research and practice.

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9. Appendices

9.1 Appendix A: Appendix for Paper 1

Appendix A1: Study 1a

Participants

Recruited through market research agency (Bilendi) and social network

Participants pre-screened based on:

- Age: 18+ (to ensure no minors participating)
- Country of residence: Germany

Online survey design

Survey flow:

1. Participants give informed consent
2. Four open-ended questions: 1. What comes into your mind when you think of sustainable brands?, 2. In your opinion, what characterizes a sustainable brand?, 3. How do you recognize a sustainable brand?, and 4. How should brands develop in the future to become more sustainable?
3. Items measuring biospheric, altruistic, and hedonic values
4. Collection of demographic data

Sample & data quality screening

Survey included one attention check. Participants it wrong were not able to finish the survey. The final sample (N = 1404) is representative for the German population in terms of gender and age.

	Sample		**German population[9]**
Age			
18-24	274	19.5%	13.0%
25-49	620	44.2%	39.4%
50-64	339	24.1%	28.9%
65-79	171	12.2%	18.7%
Mean	49.18		
Gender			
female	713	50.8%	50.7%
male	691	49.2%	49.3%
Education		18.6%	
low (ISCED 0-2)	261	45.3%	20.1%
middle (ISCED 3-4)	636	36.1%	52.7%
high (ISCED 5-8)	507	19.5%	27.2%

Note: ISCED = International Standard Classification of Education.

Table 9-1. Sample characteristics.

[9] European Commission: Eurostat (2022), DEMO_PJANIND, DEMO_PJANGROUP, edat_lfs_9903.

Measures

All of the following scales employed seven-point Likert items. All items were introduced by "How likely is the described person to yourself?". Items were presented in a randomized order.

Value orientations (Bouman et al., 2018):

Biospheric value orientation

1. It is important to that person to prevent environmental pollution.
2. It is important to that person to protect the environment.
3. It is important to that person to respect nature.
4. It is important to that person to be in unity with nature.

Altruistic value orientation

5. It is important to that person that every person has equal opportunities.
6. It is important to that person to take care of those who are worse off.
7. It is important to that person that every person is treated justly.
8. It is important to that person that there is no war or conflict.
9. It is important to that person to be helpful to others.

Hedonic value orientation

10. It is important to that person to have fun.
11. It is important to that person to enjoy the life's pleasures.
12. It is important to that person to do things he/she enjoys.

Egoistic value orientation

13. It is important to that person to have control over others' action.
14. It is important to that person to have authority over others.
15. It is important to that person to be influential.
16. It is important to that person to have money and possessions.
17. It is important to that person to work hard and be ambitious.

Preprocessing steps

Although a number of prior papers have addressed the choice of the right number of Topics *k*, there is relatively little research on the influence of the preprocessing steps performed by the researcher on the quality of the model (Heiberger & Munoz-Najar Galvez, 2021). Typical pre-processing steps can include the removal of stop words, the reduction of vocabulary stemming, or the use of n-grams (Berger et al., 2020; Shankar & Parsana, 2022). For the sake of reproducibility of results, it is especially important to be transparent about those steps and to see how they affect to quality of a topic model (Heiberger & Munoz-Najar Galvez, 2021). We tested the effect of the removal of stop words, as well as lemmatization and the use of bi- and tri-grams in combination for a range of $k = 4$ and $k = 20$ (see Table 9-2). Following prior literature, we used held-out likelihood as indicator for model quality (Wallach et al., 2009). The held-out likelihood of the STM which measures the predictive power of STMs (see Figure 9-1; Wallach et al., 2009). To estimate the held-out likelihood for each STM, researchers draw a subset of 10% of documents and then "hold out" the words they contain. Then, the likelihood of those held-out words is evaluated. Higher values indicate a more predictive model, thus having a higher quality (Heiberger & Munoz-Najar Galvez, 2021).

Model abbreviation	Removal of stopwords	Stemming	Use of n-grams
o	no	no	no
o_stem	no	yes	no
o_bi	no	no	yes
o_stem_bi	no	yes	yes
o_tri	no	no	yes
o_stem_tri	no	yes	yes
a	yes	no	no
a_stem	yes	yes	no
a_bi	yes	no	yes
a_stem_bi	yes	yes	yes
a_tri	yes	no	yes
a_stem_tri	yes	yes	yes

Table 9-2. Overview of model variants.

For the first preprocessing step, the removal of stop words, we used custom lists from the stop words package in R (snowball, marimo, nltk, stopwords-iso) and added the terms “sustainable” and “brand” as they were the most subject-related words. Figure 9-1 does not show any patterns that would indicate a negative influence of the use of stop words. Second, we tested the influence of stemming. It involves limiting words to their root form by a rule-based process (Manning et al., 2009). For this procedure, we used the Porter stemmer (Porter, 1980) included in R’s quanteda package. In this respect, significantly lower values for the held-out log likelihood are shown for the model with stop words and stemming, so that this model variant is excluded. In a final step, the influence of the use of n-grams will be examined. Using the most common 50 bi- or tri-grams did not result in major changes in held-out likelihood. However, the qualitative assessment of interpretability by the researchers showed that the use of bigrams and stop words lead to the most meaningful results, so that the choice of the number of topics *k* and the subsequent analyses will refer to the model variant "a_bi" (with stop words and bigrams, without stemming).

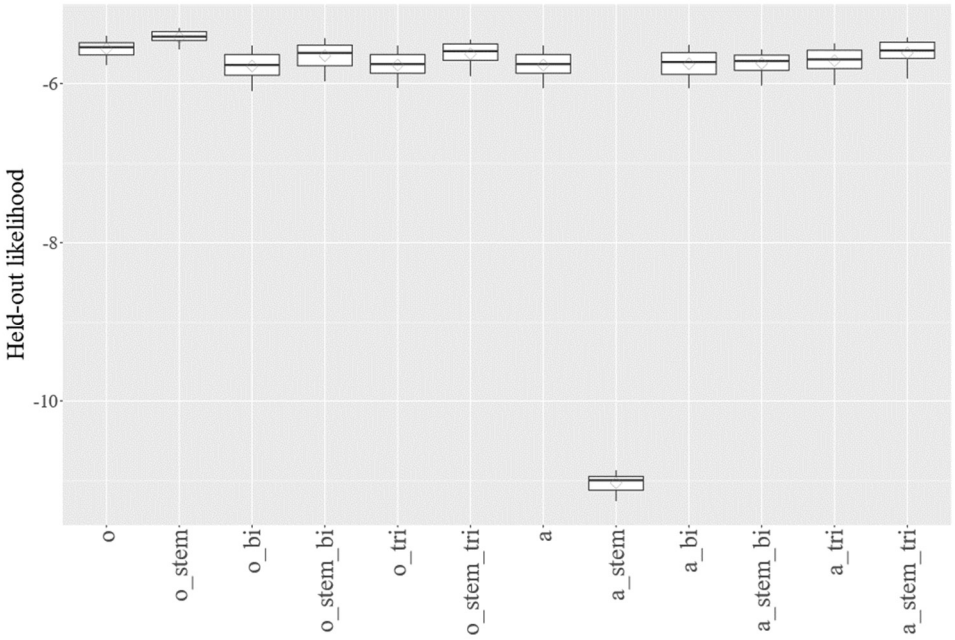

Figure 9-1. Held-out likelihood across *k* by model variants.

Finding k

While STMs offer a wide range of possibilities, they have the downside that the results depend on the choice of the number of topics *k* and thus make the researcher's decision at this point crucial for the analysis (Berger et al., 2020). Because the researcher's choice of *k* is crucial in order to provide high-quality findings that are meaningful, we applied appropriate metrics for evaluating it (Heiberger & Munoz-Najar Galvez, 2021; Shankar & Parsana, 2022). Therefore, careful evaluation is decisive and it is recommended to combine statistical approaches with the qualitative evaluation of the researchers (Berger et al., 2020; Wieczorek et al., 2021). Accordingly, we applied a twofold approach to define the optimal number of *k* before interpreting them qualitatively. In a first step, we considered the internal validity of STMs with different *k*. Secondly, we assessed the consistency across the models with different k. This aspect showed that all topics found within the STMs are nested and therefore the choice of k does not influence the semantic scope substantially.

To examine the internal validity of the STMs, we use the measures of semantic coherence and exclusivity, which are both widely used in topic modeling to define the appropriate number of *k* (Mimno et al., 2011; Roberts et al., 2014). Semantic coherence is a measure of whether a topic is internally consistent. To determine it, the frequency with which words that are highly associated with a topic (given by θ) co-occur in documents is calculated (Mimno et al., 2011). On its own, however, semantic coherence is only of limited value, since high values can also result from generally highly frequent words that systematically occur together in most of the documents present in the corpus and are associated with the same topic (Heiberger & Munoz-Najar Galvez, 2021). In addition, our considerations are supplemented by the exclusivity of topics (Roberts et al., 2014). The measure of exclusivity informs researchers about the extent to which the words a topic contains, are distinct to it, or to say the words only have high loadings in one topic (Roberts et al., 2014). Both measures complement each other, and together provide a comprehensive basis for the choice of *k*.

To identify the optimal number of k, the developers of STM recommend looking for a plateau of both indicators, indicating the "semantic coherence-exclusivity frontier" (Roberts et al., 2014, p.7) and thus giving an upper limit for a reasonable number of *k* topics. Figure 9-2 shows that this limit may be between 14 and 16. After that plateau, coherence decreases rapidly and exclusivity grows only to a very limited extent.

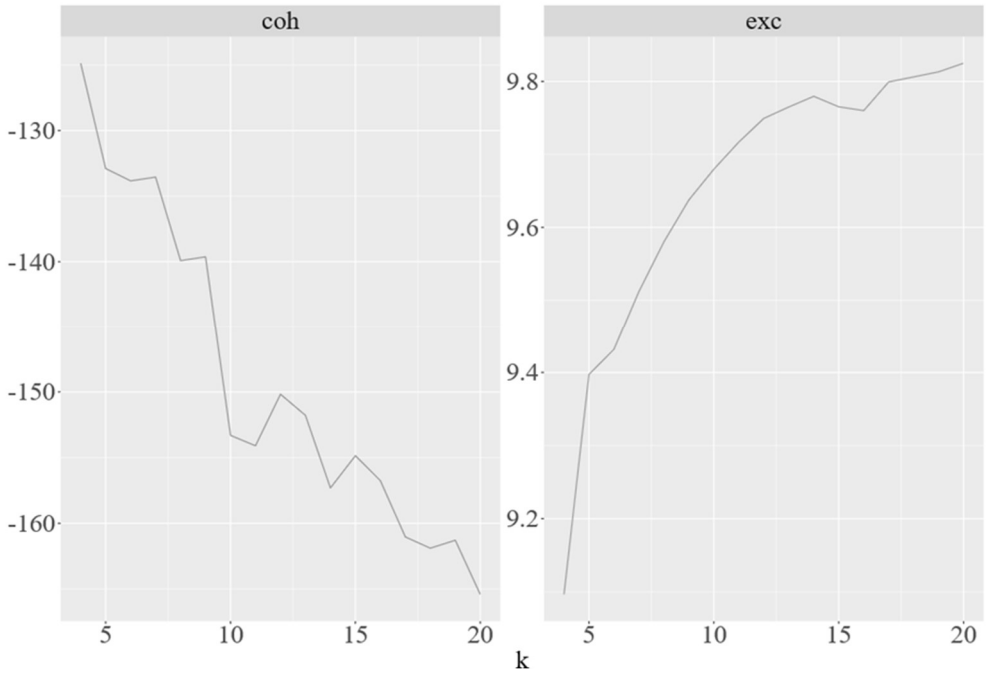

Figure 9-2. Semantic coherence and exclusivity across *k*.

To further clarify the optimal number *k* based on the two metrics, we also plot the difference in coherence and exclusivity for each model *k* with the respective model *k*-10 (Figure 9-3 and 9-4). With regard to exclusivity, researchers should choose a model in the range in which no more substantial gains in exclusivity are possible. Figure 3 reveals that with $k > 13$, there are no large gains in exclusivity and there are no substantial differences in our defined range of 14:16. For coherence with increasing K, we see a general declining trend, although it is not linear. Therefore, no visually clear "frontier" can be found as with exclusivity. However, within the range of 14:16 defined in terms of exclusivity, the least loss of coherence is shown for $k = 16$. A model with 16 topics would thus be best satisfy this criterion.

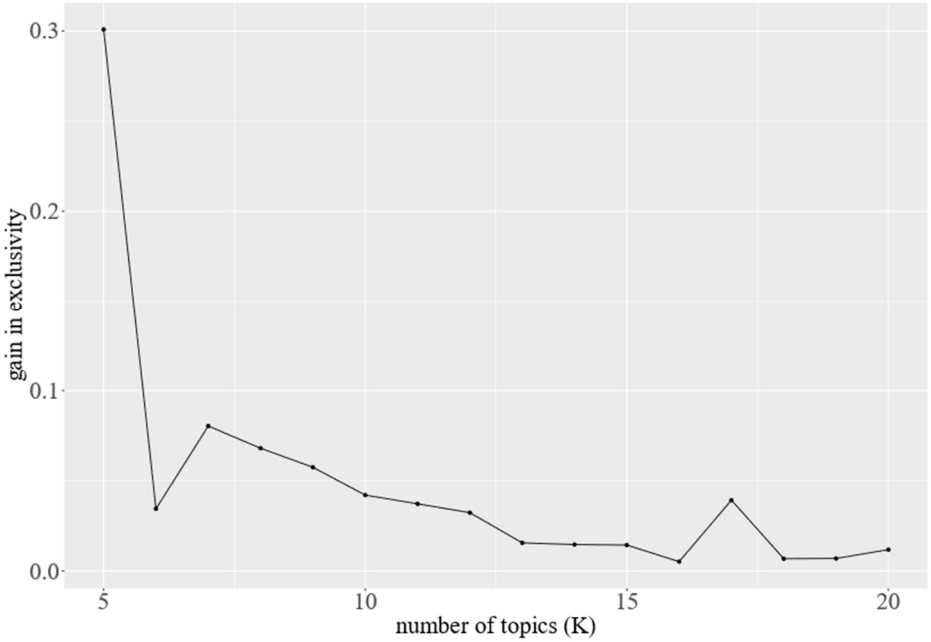

Figure 9-3. Absolute difference in average exclusivity between *k* and *k*-1.

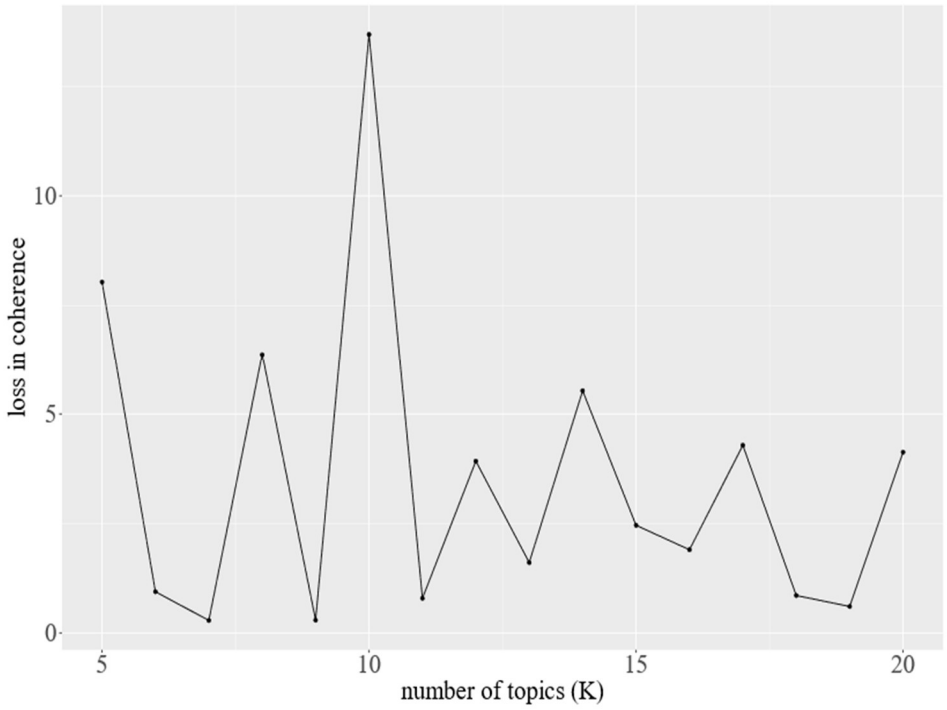

Figure 9-4. Absolute difference in average sematic coherence between *k* and *k*-1.

Lastly, we apply the "Fowlkes-Mallows index" to check the consistency of our topic model across *k*. The measure investigates the change rates for topic-document assignments across different *k* and therefore an overlap of topic-assignments for models with consecutive *k*'s (Wieczorek et al., 2021). To calculate the index, the documents were assigned to topics using a max approach, that is, each document is assigned to the topic for which there is the highest theta value. On the x-axis, Figure 9-5 shows the similarity of topic assignments for all documents between two consecutive k's. That is, each STM with *k* topics is compared to the next smaller STM (*k*-1). We see relatively high and growing values. Within the range 14:16, there is a peak for $k = 16$, showing that it is largely consistent with lower ranges of *k*. Therefore, we choose the topic model with 16 topics for our subsequent analysis.

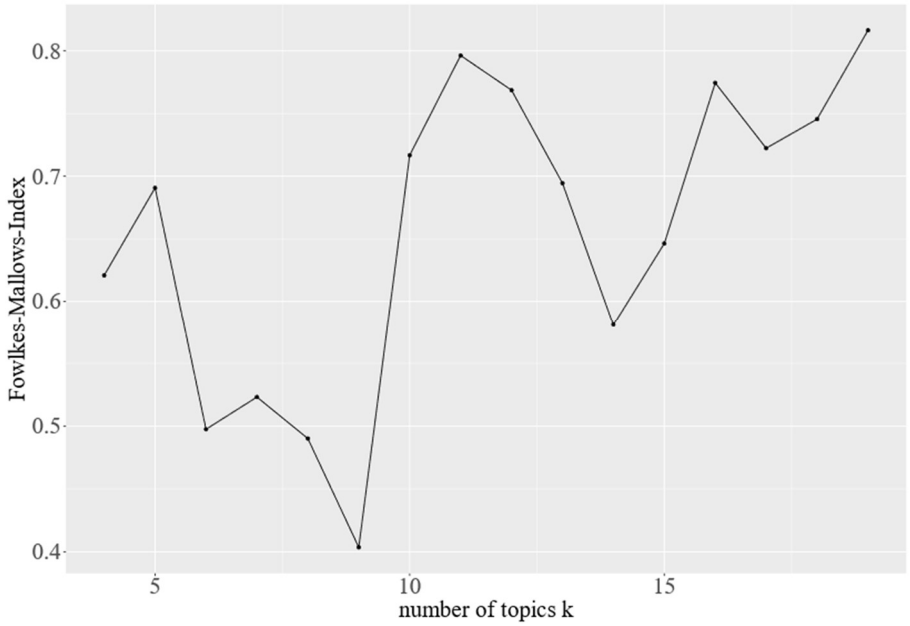

Figure 9-5. Fowlkes-Mallows index across *k*.

Appendix A2: Study 1b

Participants

Recruited through social network

Participants pre-screened based on:

- Age: 18+ (to ensure no minors participating)
- Country of residence: Germany

Age	**Gender**	***N***
18 -30 years	female	2
	male	2
31 - 45 years	female	2
	male	2
46 - 60 years	female	3
	male	2
> 60 years	female	2
	male	1
Σ		16

Table 9-3. Quota plan.

	Participants																
Topics	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13	P14	P15	P16	Σ
T1	0	0	0	0	0	0	2	2	1	0	0	1	0	0	0	0	6
T2	4	0	2	0	3	0	2	2	1	3	1	0	1	1	2	0	22
T3	2	2	0	0	2	0	0	1	2	0	2	1	0	0	1	0	13
T4	2	3	0	0	3	0	0	4	0	3	3	0	3	3	2	0	26
T5	3	10	0	0	5	0	6	1	5	4	2	2	3	3	2	0	46
T6	1	1	1	0	2	0	0	2	0	1	1	2	0	0	1	2	14
T7	0	1	0	0	3	1	1	2	0	0	0	0	1	1	0	0	10
T8	2	1	3	2	2	2	2	2	3	1	2	4	2	2	0	2	32
T9	0	0	3	0	0	4	0	2	0	0	0	1	1	0	0	1	12
T10	1	2	0	0	3	0	2	2	2	0	0	0	0	0	0	0	12
T11	2	2	1	1	2	0	0	2	0	1	0	1	0	2	0	0	14
T12	3	0	2	0	1	2	2	3	1	0	0	1	0	2	0	0	17
T13	1	0	0	0	4	0	2	1	0	2	2	0	0	0	0	0	12
T14	3	6	0	1	0	3	5	4	2	2	2	0	0	2	1	1	32
T15	0	0	3	0	0	3	2	3	0	0	1	1	1	1	3	1	19
T16	2	3	0	1	4	1	1	0	0	0	0	0	0	1	1	0	14

Table 9-4. Distribution of topics across participants.

Appendix A3: Study 2a

Pretest

In a pretest, widely-known brands in Germany from different product categories were rated on perceived brand sustainability, perceived quality, brand likeability, and brand familiarity. The brands were selected considering expected variations with regard to perceived brand sustainability. The aim was to identify pairs of brands from the same product category that significantly differ on the dimension of brand sustainability (mean difference of more than one scale point) but do not differ with respect to perceived quality, likeability, and familiarity (mean difference of less than one scale point).

76 German participants (M_{age} = 38.22, 47.4 % female,) were recruited via Clickworker. They rated 16 brands on the following four questions (all measured on seven-point Likert scales):

- How well do you know the following brands? (Brand familiarity)
- How much do you like the following brands? (Brand likeability)
- How high quality do you think the following brands are? (Perceived quality)
- How sustainable do you perceive the following brands to be? (Perceived brand sustainability)

For all participants knowing the both brands of a pair to at least some extent (brand familiarity rating > 2), we performed ANOVAs for the relevant dimensions. Based on our criteria, we identified the following brand pairs as suitable:

Brand	**Product category**	***N***	**Perceived sustainability**		**Perceived quality**	**Likeability**	**Familiarity**
			Mean	***p***	**Mean**	**Mean**	**Mean**
Frosch	Cleaning supplies	63	4.92	.000	4.95	4.63	5.44
Sagrotan			3.21		4.83	3.92	5.08
Weleda	Cosmetics	65	4.86	.000	5.35	4.49	4,95
Nivea			3.45		4.80	4.29	5,40
Alnatura	Food retailer	68	5,41	.000	5.43	4.91	5.35
Rewe			4,15		4.90	4.76	5.91

Table 9-5. Results of the pretest.

Participants

Recruited through market research agency (Dynata)

Participants pre-screened based on:

- Age: 18+ (to ensure no minors participating)
- Country of residence: Germany
- Participants indicating values below 3 (on a seven-point Likert scale) screened to ensure reasonable level of brand familiarity

Online survey design

Survey flow:

1. Participants give informed consent
2. Collection of demographic data
3. Items measuring green consumption values and self-perceived environmental knowledge
4. Random allocation to one of six brands determined by pretest (Frosch, Sagrotan, Weleda, Nivea, Alnatura, Rewe)
5. Brand familiarity
6. Presentation of 4 blocks of candidate items for BST scale (115 items total; 28/29 items per block). Items withing blocks were presented in random order. Order of blocks was randomized too. Each block ended with simple filler task as break (e.g., pictures of different vacation location to choose)

Sample & data quality screening

Screening criteria for participation in survey: +18 years, brand familiarity >3 on seven-point Likert-Scale

Survey included four attention checks. Participants answering at least one of those wrong were not able to finish the survey.

The final sample ($N = 406$) is representative for the German population in terms of gender, age, and education.

	Sample		**German population**[10]
Age			
18-24	42	10.3%	13.0%
25-49	151	37.2%	39.4%
50-64	136	33.5%	28.9%
65-79	77	19.0%	18.7%
Mean	49.18		
Gender			
female	205	50.5%	50.7%
male	201	49.5%	49.3%
Education			
low (ISCED 0-2)	78	19.2%	20.1%
middle (ISCED 3-4)	221	54.4%	52.7%
high (ISCED 5-8)	107	26.4%	27.2%

Table 9-6. Sample characteristics.

Measures

All of the following scales employed seven-point Likert items. All items were introduced by "How much do you agree to the following statements?". Items were presented in a randomized order.

Item pool (115 items)

Green consumption values (Haws et al., 2014):

1. It is important to me that the products I use do not harm the environment.
2. I consider the potential environmental impact of my action when making many of my decisions.
3. My purchase habits are affected by my concern for our environment.
4. I am concerned about wasting the resources of our planet.
5. I would describe myself as environmentally responsible.
6. I am willing to be inconvenienced in order to take actions that are more environmentally friendly.

Self-perceived environmental knowledge (adapted from Leonidou & Skarmeas, 2017):

1. I know more about sustainability than the average person.
2. I understand phrases and symbols related to sustainability on product packages.
3. I am very knowledgeable about sustainability issues.
4. I am confident that I know how to select products that are sustainable.

Exploratory Factor Analysis

We opted for Exploratory Factor Analysis (EFA) as the different aspects had not been empirically tested before. Additionally, Netemeyer et al. (2003, p. 122) note that "when the number of items exceed 30 and commonalities

[10] European Commission: Eurostat (2022), DEMO_PJANIND, DEMO_PJANGROUP, edat_lfs_9903.

exceed .60 for most items." EFA and principal component analysis (PCA) yield quite similar results. This also was the case with our current data set.

Further, we chose a Promax rotation since an oblique rotation "will reveal (in most cases) the most meaningful theoretical factors" (Netemeyer et al., 2003, p. 125).

Number of factors to retain

Such as Luchs et al. (2021), we followed the guidelines of Netemeyer et al. (2003, p. 122-24).

We chose to retain one factor based on the following criteria:

- Kaiser-Guttman criterion: only factors are retained that have an eigenvalue greater than 1. Based on this criterion, **five factors** would be retained. A more conservative rule of eigenvalues of at least 2 would suggest that **one factor** would be retained.
- Scree test: the test was used to identify the point at which the slope of the line connecting eigenvalues approaches zero. Based on this test alone, **one factor** would be retained.
- Parallel analysis test (Horn, 1965): comparison of randomly generated eigenvalues to eigenvalues from our dataset (N_{cases} = 406, N_{vars} = 115, $N_{datasets}$ = 1000, Percent = 95). Based on this test (actual eigen > random eigen), **one factor** would be retained.

Item selection

As a general rule, we chose items according to the following criteria (Comrey & Lee, 1992; Netemeyer et al., 2003) :

Item-to-total correlation > .35

Average interitem correlation > .30

Factor loading > .60

Cross loading < .30

Items that do not meet these criteria were removed an EFA was rerun. However, as noted by Netemeyer et al. (2003), "We are also unaware of definitive guidelines regarding what constitutes a high loading on a construct other than the intended construct (i.e., a "cross-loading")". Therefore, we balanced our assessment of these quantitative criteria with a qualitative assessment of the unique conceptual contribution of each item. In one case, we retained an item with a factor loading of .568 to account for the theoretical dimension of a sustainable brand personality. Additionally, we were also careful to choose items in order to avoid selecting multiple items that were conceptually redundant, in an effort to maximize the conceptual breadth of our scale with the minimum of items possible. Therefore, six items were deleted due to content similarities. If several items measuring the same dimension met all criteria, we only retained to one with the highest factor loading in the EFA. In addition, to test the adequacy of these decisions, a CFA was performed containing all 16 items identified by the EFA and one with 11 items after removal of substantively redundant statements. This showed that the scale version with 11 items had a better model fit, and a chi-square test also indicated a significant model improvement due to the reduction of substantively redundant items. Importantly, we only made exceptions to the quantitative threshold guidelines when the overall integrity of our factor was maintained, as evidenced by the Cronbach alphas comfortably exceeding the .70 threshold (.80 and above) recommended by Nunnally (Nunnally & Bernstein, 1995).

Item No.	Factor loading estimates	
	17-item scale	11-item scale
1	.92	.93
2	.90	.91
3	.89	.88
4	.87	.87
5	.86	.86
6	.83	.83
7	.81	.82
8	.82	.81
9	.89	.79
10	.80	.78
11	.75	.75
12	.82	-
13	.88	-
14	.89	-
15	.64	-
16	.82	
17	.81	-
Normed χ^2	4.623	3.125
CFI	.94	.98
TLI	.93	.97
NFI	.93	.97
RMSEA	.10	.07
SRMR	.03	.02
χ^2	550.15	137.51
df	119	44
χ^2 difference test	$\Delta\chi^2 = 412.61(\Delta df = 75) > 112.33$ ($p < .001$)	

Note: CFI = Comparative fit index, TLI = Tucker-Lewis Index, NFI = Normed fit index, RMSEA = Root mean square error of approximation, SRMR = Standardized root mean square residual

Table 9-7. Comparison of the 17- and 11-item scale.

The final 11-item PST scale is displayed in the following in Table 9-8 (α = .961):

Item No.	German
1	[Markenname] steht für nachhaltige Praktiken entlang der gesamten Wertschöpfungskette.
2	[Markenname] investiert viel in Geschäftspraktiken, die im Kern nachhaltig sind.
3	[Markenname] spiegelt die Werte einer nachhaltigen Person wider.
4	Die Marke [Markenname] bietet übersichtliche Informationsmaterialien zu ihren Nachhaltigkeitsaktivitäten an.
5	[Markenname] achtet nicht nur auf umweltfreundliche Praktiken, sondern auch auf die sozialen Aspekte von Nachhaltigkeit.
6	[Markenname] würde nicht allein des Profits wegen ein Geschäft machen, das nicht nachhaltig ist.
7	[Markenname] ist eine Marke, die kein Greenwashing betreibt.
8	[Markenname] verwendet nachhaltige Labels und Kennzeichnungen.
9	Die Marke [Markenname] legt sehr großen Wert darauf, dass ihre Angebote langlebig sind.
10	Die Marke [Markenname] vermittelt ihre nachhaltigen Werte durch ihre Werbung.
11	[Markenname] ist bestrebt, nachhaltige Produkte anzubieten, die auch bezahlbar sind.

Table 9-8. Final composition of items.

Appendix A4: Study 2b

Participants

Recruited through snowball sampling in social networks

Participants pre-screened based on:

- Age: 18+ (to ensure no minors participating)
- Country of residence: Germany

Online survey design

Survey flow:

1. Participants give informed consent
2. Collection of demographic data
3. Items measuring attitude toward the brand and perceived brand sustainability (one-item measure)
4. Presentation of short video about the sustainability engagement of the brand
5. Items measuring consumer responses with regard to the brand (including PST scale)

Sample & data quality screening

Screening criteria for participation in survey: +18 years

Survey included two attention checks. Participants answering at least one of those wrong were screened out.

	Sample (N = 416)	**Alnatura** (N = 145)	**Bionade** (N = 154)	**Weleda** (N = 117)
Age				
Mean	25.38	26.00	25.34	24.64
Gender				
female	252	99	83	70
male	164	46	71	47

Table 9-9. Sample characteristics.

	Configural invariance	**Metric invariance**	**Scalar invariance**
Normed χ^2	1.58	1.51	1.55
CFI	.967	.968	.960
TLI	.959	.964	.962
NFI	.917	.910	.895
RMSEA	.037	.035	.038
SRMR	.041	.046	.036

Table 9-10. Test of measurement invariance (model fit).

Construct	Item	Alnatura (N = 145)	Bionade (N = 154)	Weleda (N = 117)
Consumer-perceived brand sustainability (PST)	PST1	.83	.79	.84
	PST2	.78	.79	.80
	PST3	.76	.74	.75
	PST4	.79	.68	.73
	PST5	.79	.68	.84
	PST6	.66	.60	.68
	PST7	.74	.74	.70
	PST8	.58	.57	.63
	PST9	.75	.64	.73
	PST10	.67	.54	.59
	PST11	.63	.71	.71

Table 9-11. Psychometric properties (scalar invariance).

Appendix A5: Study 3

Pretest

Similarly to Study 2a, we identified brand pairs differing on perceived brand sustainability through a pretest. We used widely-known brands in the US from different product categories that were also rated on perceived brand sustainability, perceived quality, brand likeability, and brand familiarity. The same criteria as for the pretest for Study 2a were employed.

82 US-American participants (M_{age} = 43.16, 48.8 % female,) were recruited via Prolific. They rated 17 brands on the following four questions (all measured on seven-point Likert scales):

- How well do you know the following brands? (Brand familiarity)
- How much do you like the following brands? (Brand likeability)
- How high quality do you think the following brands are? (Perceived quality)
- How sustainable do you perceive the following brands to be? (Perceived brand sustainability)

For all participants knowing the both brands of a pair to at least some extent (brand familiarity rating > 2), we performed ANOVAs for the relevant dimensions. Based on our criteria, we identified the following brand pairs as suitable:

Brand	**Product category**	***N***	**Perceived sustainability**		**Perceived quality**	**Likeability**	**Familiarity**
			Mean	***p***	**Mean**	**Mean**	**Mean**
Seventh Generation	Cleaning supplies	54	5.44	.000	5.17	4.85	5.09
Clorox			4.02		5.33	4.83	5.96
Seventh Generation	Cleaning supplies	54	5.43	.000	5.17	4.81	5.09
Mr. Clean			4.13		5.19	4.69	5.89
Mrs. Meyers	Cleaning supplies	55	5.29	.000	5.22	4.87	4.95
Clorox			4.09		5.25	4.71	5.82
Mrs. Meyers	Cleaning supplies	56	5.23	.000	5.18	4.84	4.91
Mr. Clean			4.04		5.09	4.54	5.75
Bronner's	Cosmetics	45	5.18	.000	5.29	4.89	4.67
Neutrogena			4.27		5.02	4.76	5.27
Whole Foods	Food retailer	67	5.33	.000	5.69	5.00	5.60
Kroger			4.16		4.84	4.55	5.58
Wholefoods	Food retailer	74	5.34	.000	5.68	4.97	5.59
Target			4.23		5.01	5.32	6.35
Wholefoods	Food retailer	71	5.39	.000	5.69	5.03	5.68
Costco			4.39		5.28	5.07	5.90
Trader Joes	Food retailer	69	5.23	.000	5.30	5.30	5.42
Kroger			4.13		4.87	4.52	5.59
Trader Joes	Food retailer	76	5.24	.000	5.30	5.33	5.45
Target			4.21		5.00	5.30	6.25
Trader Joes	Food retailer	72	5.24	.000	5.32	5.36	5.57

Table 9-12. Results of the pretest.

Participants

Recruited through Prolific

Participants pre-screened based on:

- Age: 18+ (to ensure no minors participating)
- Country of residence: USA

Online survey design

Survey flow:

1. Participants give informed consent
2. Collection of demographic data
3. Random allocation to one of two brands determined by pretest (Whole Foods, Target)
4. Ratings of items incorporated into test of discriminant validity
5. Items related to consumer characteristics: category involvement, attitude toward sustainability, and consciousness for sustainable consumption

Sample & data quality screening

Screening criteria for participation in survey: +18 years

Survey included two attention checks. Participants answering at least one of those wrong were not able to finish the survey.

The final sample $N = 492$ is representative for the US population in terms of gender and age.

	Sample ($N = 492$)	**Whole Foods** ($N = 243$)	**Target** ($N = 243$)
Age			
Mean	41.18	39.69	42.69
Gender			
Female	239	129	110
Male	241	114	127
Non-binary	12	6	6

Table 9-13. Sample characteristics.

Measures

All of the following scales employed seven-point Likert items. All items were introduced by "How much do you agree to the following statements?", except as noted below. Items were presented in a randomized order.

PST scale (11 items)

Consumer-perceived CSR (Öberseder et al., 2014):
How much do you think that [brand name] takes responsibility for the following aspects?

1. Contribute to the economic development of the region
2. Create jobs for people in the region
3. Source products and raw materials locally
4. Respect regional values, customs, and culture
5. Communicate openly and honestly with the local community
6. Set decent working conditions
7. Treat employees equally
8. Offer adequate remuneration
9. Develop, support and train employees
10. Communicate openly and honestly with employees
11. Flexible working hours for employees
12. Invest capital of shareholders correctly
13. Communicate openly and honestly with shareholders
14. Provide sustainable growth and long-term success
15. Reduce energy consumption
16. Reduce emissions like CO_2
17. Prevent waste
18. Recycle
19. Corporate environmental protection standards are higher than legal requirements
20. Employ people with disabilities
21. Employ long-term unemployed
22. Make donations to social facilities
23. Support employees who are involved in social projects during working hours
24. Invest in the education of young people
25. Contribute to solving societal problems
26. Implement fair sales practices
27. Label products clearly and in a comprehensible way
28. Meet quality standards
29. Set fair prices for products
30. Offer safe (not harmful) products
31. Offer the possibility to file complaints
32. Provide fair terms and conditions for suppliers
33. Communicate openly and honestly with suppliers
34. Negotiate fairly with suppliers
35. Select suppliers thoroughly with regard to respecting decent employment conditions
36. Control working conditions at suppliers

Green brand image (Chen, 2010):

1. [Brand name] is regarded as the best benchmark of environmental commitments.
2. [Brand name] is professional about environmental reputation.
3. [Brand name] is successful about environmental performance.
4. [Brand name] is well established about environmental concern.
5. [Brand name] is trustworthy about environmental promises.

Perceived greenwashing (Leonidou & Skarmeas, 2017):

1. [Brand name] misleads with words about the environmental features of its products.
2. [Brand name] misleads with visuals or graphics about the environmental features of its products.
3. [Brand name] provides vague or seemingly unprovable environmental claims for its products.
4. [Brand name] overstates or exaggerates the environmental features of its products.
5. [Brand name] leaves out or hides important information about the real environmental features of its products.

Corporate reputation (Hur et al., 2014):

1. [Brand name] is a brand I have a good feeling about.
2. [Brand name] is a brand that I admire and respect.
3. [Brand name] has a good overall reputation.

Brand authenticity (Cinelli & LeBoeuf, 2020):
I think [Brand name] is; semantic differential

1. Not authentic at all – Very authentic
2. Motivated by profit – Motivated by passion

Brand credibility (Erdem & Swait, 2004):

1. [Brand name] delivers what it promises.
2. The product claims of [brand name] are believable.
3. Over time, my experiences with [brand name] have led me to expect it to keep its promises, no more and no less.
4. [Brand name] has a name you can trust.
5. [Brand name] doesn't pretend to be something it isn't.
6. [Brand name] reminds me of someone who's competent and knows what he/she is doing.
7. [Brand name] has the ability to deliver what it promises.

Item No.	**Sample** (N = 492)	**Whole Foods** (N = 249)	**Target** (N = 243)
1	.88	.84	.90
2	.87	.84	.89
3	.88	.87	.88
4	.83	.76	.65
5	.82	.82	.80
6	.66	.65	.67
7	.52	.55	.56
8	.82	.81	.80
9	.70	.74	.70
10	.79	.69	.82
11	.70	.68	.81
Normed χ^2	4.70	2.67	
CFI	.96	.96	
TLI	.95	.95	
NFI	.95	.94	
RMSEA	.08	.06	
SRMR	.04	.06	
χ^2	206.96	26.16	
df	44	98	

Table 9-14. Model fit and psychometric properties.

Construct	*CR*	*AVE*		*r* between constructs	HTMT ratio
PST	.943	.607	.779	.725	.721
CSR	.978	.551	.742		
PST	.943	.606	.779	.879	.880
GBI	.952	.708	.841		
PST	.943	.606	.779	-.438	-.438
PGW	.964	.842	.918		
PST	.934	.568	.754	.779	.781
CREP	.921	.797	.893		
PST	.943	.607	.779	.744	.742
PBA	.570	.631	.794		
PST	.943	.607	.779	.672	.672
PBC	.960	.776	.881		

Note: GBI = Green brand image. PGW = Perceived greenwashing. CREP = Corporate reputation. PBA = Perceived brand authenticity. PBC = Perceived brand credibility

Table 9-15. Discriminant validity tests – Fornell-Larcker criterion and HTMT ratio.

Appendix A6: Study 4

Participants

Recruited through market research agency (Dynata)

Participants pre-screened based on:

- Age: 18+ (to ensure no minors participating)
- Country of residence: France, Italy, Hungary, the Netherlands, Poland, and Spain

Online survey design

Survey flow:

1. Participants give informed consent
2. Collection of demographic data
3. Presentation of information about a national brand in the food sector
4. General attitudinal variables
5. PST scale

Sample & data quality screening

Screening criteria for participation in survey: +18 years

Survey included three attention checks. Participants answering at least one of those wrong were not able to finish the survey.

The final sample (N = 3939) is representative for the respective population in terms of gender, age, and education.

	France (N = 603)			**Hungary** (N = 607)			**Italy** (N = 590)			**Netherlands** (N = 596)			**Poland** (N = 466)			**Spain** (N = 1077)		
	N	**%**	**P**	***N***	**%**	**P**	***N***	**%**	**P**	***N***	**%**	**P**	***N***	**%**	**P**	***N***	**%**	**P**
Age																		
18-24	51	8.5%	8.8%	77	12.7%	13.0%	69	11.7%	11.3%	83	13.9%	15.4%	61	13.1%	13.5%	94	8.7%	11.9%
25-49	240	39.8%	39.7%	266	43.8%	44.1%	211	35.8%	35.8%	246	41.3%	39.7%	244	52.3%	50.2%	477	44.3%	40.1%
50-64	178	29.5%	29.3%	146	24.1%	23.9%	146	24.7%	25.9%	156	26.2%	26.4%	115	24.7%	25.8%	264	24.5%	24.9&
65-79	134	22.2%	22.2%	118	19.4%	19.0%	164	27.8%	27.0%	111	18.6%	18.5%	46	9.9%	10.5%	242	22.5%	23.1%
Gender																		
Female	312	51.7%	51.6%	318	52.4%	52.1%	304	51.5%	51.3%	301	50.5%	50.3%	241	51.7%	51.6%	557	51.7%	51.0%
Male	290	48.1%	48.4%	287	47.3%	47.9%	286	48.5%	48.7%	294	49.3%	49.7%	225	48.3%	48.4%	519	48.3%	40.0%
Nonbinary	1	0.2%	0.0%	2	0.3%	0.0%	0	0.0%	0.0%	1	0.2%	0.0%	0	0.0%	0.0%	1	0.0%	0.0%
Education																		
Low	128	21.2%	21.2%	119	19.6%	19.7%	232	39.3%	40.3%	131	22.0%	24.0%	55	11.8%	10.8%	422	39.2%	40.5%
Middle	263	43.6%	43.8%	342	56.3%	56.7%	250	42.4%	42.1%	243	40.8%	39.4%	273	58.6%	61.5%	278	25.8%	24.7%
High	212	35.2%	35.0%	146	24.1%	23.6%	108	18.3%	17.5%	222	37.2%	36.6%	138	29.6%	27.7%	377	35.0%	34.8%

Note. P = population (representative distribution). ISCED = International Standard Classification of Education: low (ISCED 0-2), middle (ISCED 3-4), high (ISCED 5-8)

Table 9-16. Sample characteristics.

Measures

All of the following scales employed seven-point Likert items/semantic differentials. All items for PST and purchase intention were introduced by "How much do you agree to the following statements?". Items for attitude toward a product of the brand were introduced by "Please evaluate this product on the following dimension". Items were presented in a randomized order.

Purchase intention (Zolfagharian et al., 2017):

1. I would definitely intend to buy it.
2. I would absolutely consider buying it.

Attitude toward a product of the brand (Schroll et al., 2018):

1. Dislike - Like
2. Bad - Good
3. Unappealing - Appealing
4. Unfavorable – Favorable
5. Low quality – High quality

PST scale

	Configural invariance	**Metric invariance**	**Scalar invariance**
Normed χ^2	2.91	2.92	3.51
CFI	.974	.971	.959
TLI	.970	.969	.960
NFI	.961	.957	.942
RMSEA	.022	.022	.025
SRMR	.024	.026	.026

Table 9-17. Test of measurement invariance (model fit).

Construct	**Item**	**France** (*N* = 603)	**Hungary** (*N* = 607)	**Italy** (*N* = 590)	**Netherlands** (*N* = 596)	**Poland** (*N* = 466)	**Spain** (*N* = 1077)
Consumer-perceived brand sustainability (PST)	PST1	.91	.86	.85	.85	.88	.88
	PST2	.90	.85	.87	.84	.85	.86
	PST3	.90	.88	.87	.84	.87	.87
	PST4	.88	.82	.84	.83	.87	.86
	PST5	.81	.85	.75	.83	.85	.83
	PST6	.74	.68	.66	.79	.63	.67
	PST7	.75	.66	.61	.75	.557	.70
	PST8	.88	.80	.84	.82	.86	.85
	PST9	.92	.83	.82	.81	.74	.85
	PST10	.86	.77	.82	.81	.81	.84
	PST11	.87	.83	.85	.82	.83	.84
Product Attitude (PA)	PA1	.85	.81	.81	.87	.85	.84
	PA2	.90	.80	.83	.87	.86	.81
	PA3	.84	.83	.84	.85	.89	.84
	PA4	.86	.80	.78	.87	.81	.80
	PA5	.81	.77	.78	.97	.80	.79
Purchase intention (PI)	PI1	.87	.76	.85	.92	.95	.85
	PI2	.89	.69	.79	.90	.86	.83

Table 9-18. Psychometric properties (scalar invariance).

Construct	Mean	*SD*	*AVE*	*CR*	HTMT ratio to PST	PST	PA
France (*N* = 603)							
PST	5.42	1.10	.735	.968	-	*.858*	
PA	5.96	1.07	.727	.930	.604	.604	*.853*
PI	5.09	1.39	.775	.873	.580	.580	.640
Hungary (*N* = 607)							
PST	5.89	1.00	.645	.952	-	*.803*	
PA	6.29	.98	.646	.901	.681	.680	*.804*
PI	5.44	1.50	.528	.690	.572	.571	.731
Italy (*N* = 590)							
PST	5.77	1.12	.643	.952	-	*.802*	
PA	6.29	.94	.655	.905	.538	.538	*.809*
PI	5.48	1.33	.676	.806	.557	.557	.506
Netherlands (*N* = 596)							
PST	5.28	1.06	.670	.957	-	*.817*	
PA	5.49	1.23	.750	.937	.753	.753	*.866*
PI	5.03	1.53	.828	.906	.611	.611	.812
Poland (*N* = 466)							
PST	5.58	1.06	.644	.951	-	*.802*	
PA	6.25	.97	.711	.925	.626	.625	*.843*
PI	5.56	1.40	.828	.900	.531	.530	.692
Spain (*N* = 1077)							
PST	5.54	1.12	.680	.959	-	*.825*	
PA	6.04	1.19	.666	.909	.557	.556	*.816*
PI	5.50	1.54	.701	.824	.575	.575	.651

Note: AVE = average variance extracted; CR = composite reliability; square roots of AVE are given on the diagonal (in italics); all correlations significant at the 1% level.

Table 9-19. AVEs and correlations (scalar invariance).

Correlations	**β**		**R^2**		**Meng et al. 's test**	
	France (N = 603)					
	PST scale	*OIM*	*PST scale*	*OIM*	*z*	*p*
	r = .709		*r = .709*			
PA ↔PST	.566	.497	.319	.246	5.026	.000
PI ↔ PST	.522	.471	.271	.220	6.251	.000
	Hungary (N = 607)					
	PST scale	*OIM*	*PST scale*	*OIM*	*z*	*p*
	r = .680		*r = .680*			
PA ↔PST	.614	.526	.376	.275	2.404	.000
PI ↔ PST	.463	.446	.213	.197	6.723	.000
	Italy (N = 590)					
	PST scale	*OIM*	*PST scale*	*OIM*	*z*	*p*
	r = .672		*r = .672*			
PA ↔PST	.666	.604	.442	.364	0.240	.405
PI ↔ PST	.537	.479	.287	.228	4.390	.000
	Netherlands (N = 596)					
	PST scale	*OIM*	*PST scale*	*OIM*	*z*	*p*
	r = .669		*r = .669*			
PA ↔PST	.516	.584	.266	.218	5.419	.000
PI ↔ PST	.512	.392	.262	.153	4.733	.000
	Poland (N = 466)					
	PST scale	*OIM*	*PST scale*	*OIM*	*z*	*p*
	r = .654		*r = .654*			
PA ↔PST	.590	.530	.346	.279	1.969	.025
PI ↔ PST	.501	.444	.249	.195	4.149	.000
	Spain (N = 1077)					
	PST scale	*OIM*	*PST scale*	*OIM*		
	r = .636		*r = .636*			
PA ↔PST	.491	.465	.241	.216	5.975	.000
PI ↔ PST	.472	.330	.223	.108	6.086	.000

Note: OIM = one-item measure.

Table 9-20. Test of predictive validity.

Appendix A7: Study 5

Participants

Recruited through Prolific

Participants pre-screened based on:

- Age: 18+ (to ensure no minors participating)
- Country of residence: USA

Online survey design

Survey flow:

1. Participants give informed consent
2. Collection of demographic data
3. Random allocation to one of four experimental groups
4. Manipulation of identity salience
5. Ostensibly unrelated survey part on fashion brand, including presentation of stimuli and subsequent rating of items

Sample & data quality screening

Screening criteria for participation in survey: +18 years

Survey included three attention checks. Participants answering at least one of those wrong were not able to finish the survey.

N = 601 prior to quality check
N = 601 after excluding straight liner

The final sample is representative for the US population in terms of gender and age.

	Sample (*N* = 601)	**Elo Vogue** (*N* = 296)	**Eco Vogue** (*N* = 305)
Age			
Mean	41.71	42.11	41.31
Gender			
Female	299	135	164
Male	287	151	136
Non-binary	15	10	5

Table 9-21. Sample characteristics.

Measures

All of the following scales employed seven-point Likert items. All items were introduced by "How much do you agree to the following statements?", except as noted below. Items were presented in a randomized order.

Purchase intention (Meng & Chan, 2022):

1. I am likely to buy [Brand name].
2. I would definitely buy [Brand name].
3. If I see a product from [Brand name] next time, I'll consider buying it.

Brand evaluation (Goldsmith et al., 2000):
My first impression of [Brand name] is …

1. Very bad – Very good
2. Unfavorable - Favorable
3. Unsatisfactory - Satisfactory

Anticipated brand quality (adapted from Erdem & Swait, 2004):

1. The quality of [Brand name] seems to be very high.
2. In terms of overall quality, I'd rate [Brand name] as very good.

WOM intention (Maxham & Netemeyer, 2002):

1. I am likely to say good things about [Brand name].
2. I would recommend [Brand name] to my friends and relatives.
3. If my friends were looking for a new brand of this type, I would tell them to try [Brand name].

Consciousness toward sustainable consumption (Three items for environmental and social sustainability each, Balderjahn et al., 2018):
I buy a product only if I believe that ...

1. it was made from recycled materials.
2. it was packaged in an environmentally-friendly manner.
3. it was produced in a climate-friendly manner.
4. workers' human rights were respected during the manufacturing process.
5. workers were not discriminated against.
6. workers were fairly and equitably compensated.

PST scale (11 items)

Item No.	**Elo Vogue** (N = 296)	**Eco Vogue** (N = 305)
1	.90	.88
2	.90	.88
3	.91	.83
4	.85	.78
5	.89	.78
6	.62	.61
7	.44	.57
8	.90	.75
9	.61	.71
10	.86	.73
11	.89	.72
Normed χ^2	3.44	
CFI	.96	
TLI	.95	
NFI	.94	
RMSEA	.06	
SRMR	.04	
χ^2	302.53	
df	88	

Table 9-22. Model fit and psychometric properties.c

9.2 Appendix B: Appendix for Paper 2

Construct	Items	Source
Product sustainability perception [a, b, c]	How sustainable do you perceive these jeans? (11-point scale in Study 1; seven-point scale in Study 2a+b)	Gershoff & Frels, 2015
Purchase intention [b, c]	How likely would you be to buy these jeans?	Schroll et al., 2018
Product evaluation [b, c]	*Please evaluate these jeans on the following dimensions:* Dislike – Like Bad – Good Unappealing – Appealing Unfavorable – Favorable	Schroll et al., 2018
Word-of-mouth (WOM) intention [b, c]	I would recommend these jeans to someone who seeks my advice. I would say positive things about these jeans to other people. I would recommend these jeans to others.	Price & Arnould, 1999
Relative willingness-to-pay (WTP) [b, c]	How much would you be willing to pay for these jeans? (Seven-point scale ranging from $/€70 to $/€190)	Schmidt & Bijmolt, 2020
Biospheric value orientation [a]	*Please indicate the extent to which each portrayed person is like you.* It is important to that person to prevent environmental pollution. It is important to that person to protect the environment. It is important to that person to respect nature. It is important to that person to be in unity with nature.	Bouman et al., 2018
Altruistic value orientation [a]	It is important to that person that every person has equal opportunities. It is important to that person to take care of those who are worse of. It is important to that person that every person is treated justly. It is important to that person that there is no war or conflict. It is important to that person to be helpful to others.	Bouman et al., 2018
Manipulation check (holistic sustainability) [b, c]	The brand that offers the presented jeans implements a comprehensive and holistic sustainability approach. The sustainability of this jeans covers both environmental and social aspects. All phases of the life-cycle from sourcing over production to the end-of-life of the jeans are designed sustainably. The brand that offers the presented jeans only covers some aspects of sustainability and therefore follows a selective sustainability approach. Only one phase of the jeans (production) is designed sustainably. The sustainability of this jeans covers only one dimension of sustainability (either environmental or social).	

Note: All constructs were measured on seven-point scales, except if indicated otherwise. Subscript letters indicate in which study the measurements were used: a = Study 1, b = Study 2a, c = Study 2b

Table 9-23. Overview of measures.

9.3 Appendix C: Appendix for Paper 5

Measure	Items	Scale
Health consciousness *(Birch et al., 2018)*	*Please state how much you agree or disagree with the following statements.* 1. I am very conscious about my health and the health of others for whom I shop in the household 2. I take responsibility for the state of my health and the health of others for whom I shop in the household 3. I am very involved with my health and the health of others for whom I shop in the household	Seven-point scale (1 = "strongly disagree", 7 = "strongly agree")
Ethical identity *(Birch et al., 2018)*	*Please state how much you agree or disagree with the following statements.* 1. Ethics are important to me when making buying decisions 2. I think of myself as someone who is concerned about ethical issues 3. I think of myself as an ethical consumer	Seven-point scale (1 = "strongly disagree", 7 = "strongly agree")
Environmental consciousness *(Birch et al., 2018)*	*Please state how much you agree or disagree with the following statements.* 1. The balance of nature is strong enough to cope with the impacts of modern industrial nations 2. The so-called ecological crisis facing human kind has been greatly exaggerated 3. Humans have the right to modify the natural environment to suit their needs	Seven-point scale (1 = "strongly disagree", 7 = "strongly agree")
Domestic provenance importance	*When buying food, how important are the following points to you?* 1. knowledge about who produced the product 2. regional origin of products 3. buying products from the home country	Seven-point scale (1 = "not at all important", 7 = "very important")
COVID-19 attitude change towards SFSCs	*To what extent has the Covid pandemic changed…* 1. your opinion of SFSC? 2. your intent to purchase from SFSCs? 3. your intent to support local producers?	seven-point scale (1= "highly decreased it", 7 = "highly increased it")
Accessibility *(adapted from Megicks et al. 2012)*	*"When I don't buy from SFSCs…"* 1. this is because they are not readily available 2. this is because it is hard to get there 3. this is because of limited opening hours	Seven-point scale (1 = "strongly disagree", 7 = "strongly agree")
Potential future purchase behavior	*Please state how much you agree or disagree with the following statements.* 1. I strongly intend to purchase more food from SFSCs in the future 2. I plan to purchase more food from SFSCs in the future 3. I would like to purchase more food from SFSCs in the future	Seven-point scale (1 = "strongly disagree", 7 = "strongly agree")

Table 9-24. Measurement scales and items.