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Can a meta sustainability label facilitate more sustainable consumer choices?

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Abstract

The current sustainability labeling landscape has been accused of creating unnecessary consumer confusion due to too much, too complex, too similar, and too ambiguous information. Meta-sustainability labeling is proposed as a solution. We provide the first evidence on the added value of this instrument based on a survey in the USA ($N = 518$) and Germany ($N = 520$). Participants were randomly allocated to one of four different conditions: (1) traditional labeling, (2) new, common label design, (3) traditional labeling plus meta label, and (4) new, common label design plus meta label. The study confirms the preference for sustainability-labeled products in both countries. In the USA, the new, common label design outperforms traditional labeling. Adding a meta label reduced the effect. In Germany, both the common labeling design and the meta label improved the effectiveness of sustainability labeling for some consumer segments. The new designs are built on the branding of the UN's Sustainable Development Goals, which makes them practically relevant for global implementation.

KEYWORDS
consumer confusion, discrete choice experiment, latent class analysis, meta sustainability label, sustainable development goals (SDGS)

1 | INTRODUCTION

Sustainability labeling is proliferating with the number of recognized sustainability labels worldwide growing and currently over 450 (Delmas & Lessem, 2017). At first sight, this seems to be good news. After all, prior research and praxis have demonstrated the value of sustainability labels as a tool to drive individual consumption decisions in a more sustainable direction (Girod et al., 2014; Hille et al., 2018; Spaargaren & Mol, 2008; Thøgersen, 2005; Travaille et al., 2019). However, not only the overall number but, more importantly, also the number of labels consumers are confronted with in their local supermarket has increased. As a result, consumers sometimes feel they are confronted with too much, too complex, too indistinguishable, and/or too ambiguous sustainability information, which leaves them confused (Burke et al., 1997; Y.-S. Chen & Chang, 2013; Heinzle & Wüstenhagen, 2012). Research suggests that the effect of sustainability labeling on sustainable product choices might, therefore, be lower than it could be (Grunert et al., 2014; Horne, 2009; Lyon & Montgomery, 2015). If consumer confusion exceeds an acceptable level, consumers may respond in unwise (Ozanne et al., 2021) or unfortunate ways, such as ignoring sustainability labels, engaging in impulsive buying, or becoming paralyzed in inaction (Fitzgerald et al., 2019).

Meta-sustainability labeling has been suggested as a tool to counter at least some of this consumer confusion and the associated

Abbreviations: COO, country of origin; DCE, discrete choice experiment; ESOMAR, European Society for Opinion and Marketing Research; ISO, International Organization for Standardization; LC, latent class; LGC, Latent Gold Choice; MNL, multinomial logit model; SDGs, Sustainable Development Goals.

negative consequences. According to Dendler (2014, p. 81), a meta sustainability label scheme "condenses existing product-labels and other communication measures into an overarching Sustainability message in order to enable household consumers better to align purchase decisions with Sustainable Development goals."

A meta-sustainability label is a scheme that, in principle, integrates all dimensions of sustainability and visually signals the overall sustainability performance of a labeled product to the consumers. For example, Ge and Brewster (2016) view a meta-sustainability label as "a label about labels." Torma and Thøgersen (2021) refer to it, more broadly, as an umbrella, family, or higher-order labeling, as opposed to a single-issue, stand-alone label, such as the Fairtrade or the EU organic label (Torma & Thøgersen, 2021).

The belongingness of a traditional single-issue sustainability label to a meta-sustainability scheme can be visually signaled to consumers by either adding a meta label as a supplement to traditional labels or by replacing the traditional design with a family design that signals the same meta-label scheme. Either way, a meta-sustainability label accounts for and connects relevant sustainability dimensions by uniting the communication of single-issue labels as sub-labels of an overall meta-sustainability labeling scheme.

While the meta-sustainability labeling concept is increasingly recognized in the literature, there is disagreement regarding its ability to reduce consumer confusion. Some scholars argue that a meta-sustainability label would indeed reduce consumer confusion (Bernard et al., 2015; Dendler, 2013), whereas others argue the opposite: that it is more likely to further increase consumer confusion (Eberle et al., 2011; Ge & Brewster, 2016; Tobi et al., 2019). However, according to a recent, systematic literature review, existing research on meta-sustainability labeling is purely theoretical and does not allow a firm conclusion regarding the usefulness of a meta-sustainability label from a consumer point of view (Torma & Thøgersen, 2021). In this study, we, therefore, address the key questions raised in prior research on the topic, namely whether consumers value a meta-sustainability label (Asioli et al., 2020), and whether such a label will help consumers make more sustainable decisions (Torma & Thøgersen, 2021).

The article proceeds as follows. First, we argue that the existing landscape of stand-alone and single-issue sustainability labels has reached a critical threshold, and we introduce how meta-sustainability labeling can be visually communicated to facilitate more sustainable product choices. After that, we introduce the employed method and report and discuss the results. Finally, we reflect on the study's limitations and implications and propose further ideas for research on meta-sustainability labeling.

2 | BACKGROUND

2.1 | Sustainability labeling under critique

Product labeling is considered an effective tool to reduce the information asymmetry between seller and buyer regarding credence attributes (Darby & Karni, 1973), such as sustainability (Acharya, 2020; Bratt et al., 2011). A credible sustainability label makes the product's sustainability performance a search attribute by removing or substantially reducing the information asymmetry. Ideally, this provides consumers with full disclosure about the product's sustainability performance (Frydendal et al., 2018). Specifically, a sustainability label must offer timely, effective, and efficient support for consumers so that they can identify sustainable product alternatives at the point of purchase. Not only companies but also governments and NGOs use product labeling to enable the individual to make more sustainable consumption choices – for the greater good of the planet (Reisch et al., 2017).

The most common type of sustainability labeling has the following characteristics: "consumer facing, focused on a single issue, oriented to renewable resources (food, agriculture, or forest products), run by a non-profit voluntary organization, does not use life-cycle analysis, is not focused on product-level processes and production methods, is based in Europe or North America, and has a national scope" (Lyon & Montgomery, 2015, p. 240). Examples include the Marine Stewardship Council and the Forest Stewardship Council certifications. The rise of sustainability labeling reflects a movement towards a more sustainability-sensitive society and more sustainable lifestyles (Prothero et al., 2011). However, it is problematic that sustainability labeling schemes generally focus on a single issue only, which can lead to "waterbed effects" where one sustainability problem is reduced in a way that increases other sustainability problems. Single-issue sustainability labeling also fails to capture the variety of sustainable development goals expressed, for example, in the United Nations' Sustainable Development Goals (United Nations SDGs). Furthermore, the plethora of different single-issue sustainability labels have been accused of increasing confusion and skepticism among consumers (Bratt et al., 2011). Hence, there is a risk that the high and growing number of stand-alone, single-issue sustainability labels undermines the basic purpose of these labels (Chen & Chang, 2013; Turnbull et al., 2000).

2.2 | Meta-sustainability labeling

Janßen and Langen (2017) suggest that a meta-sustainability label could replace the diverse single-issue sustainability labels included in their study and would satisfy 84% of consumers. The primary purpose of a meta-sustainability label is to reinforce and extend the benefits of sustainability labeling by accounting for and connecting relevant sustainability dimensions. Such a label would unite single-issue sustainability labels as sub-labels in an overall meta-labeling scheme. We distinguish between three different ways of visually communicating the belongingness of a sustainability label to a meta-sustainability label design to consumers: Transferring the traditional label into a family design (#2 in Figure 1), adding a meta-label to a traditional label (#3), and combining a meta label and a family design (#4).

A meta-sustainability label that comprises several sub-labels may facilitate a better understanding of the differences between specific, single-issue labels and facilitate learning about the multi-dimensional

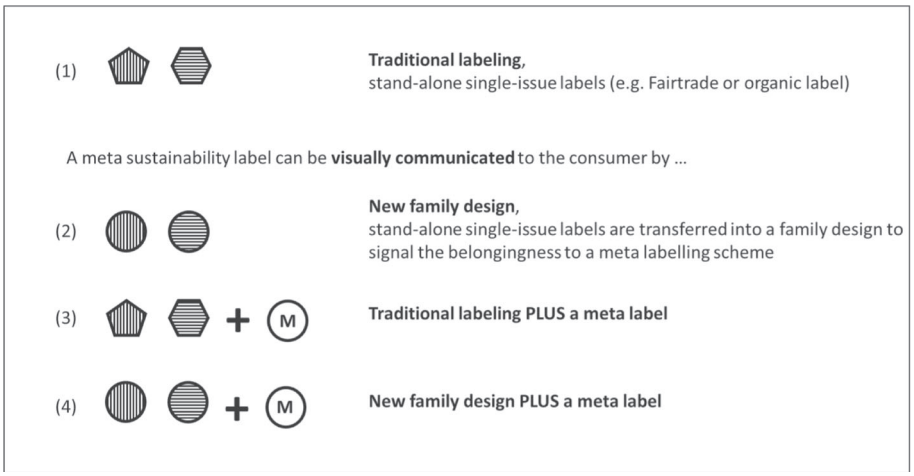

FIGURE 1 Ways to visually communicate a meta sustainability labeling scheme.

concept of sustainability in general (Carlson & Palmer, 2016; Revermann et al., 2015). It signals interrelatedness and reassures consumers that (in principle) impacts on all relevant sustainability dimensions are considered, even when they fall outside of the actual focus of a single-issue label. A meta-sustainability label thereby allows the consumer to distinguish between products that live up to the broad sustainability criteria of the meta-labeling scheme and those that do not (Engels et al., 2010). However, similar to existing sustainability labels, a meta-sustainability label's credibility will depend on strict sustainability standards and the credibility of the organization behind the label certification (Gruère, 2015).

In sum, we argue that a visually communicated meta-sustainability labeling scheme can help consumers make more informed decisions. The overall objective of such a label is to enable consumers to navigate the vast and confusing landscape of sustainability labeling. Hence, our fundamental hypothesis is that a meta-sustainability labeling scheme can reduce (unnecessary) consumer confusion and increase clarity and understanding of sustainability labeling (a detailed conceptualization of consumer confusion can be found in Appendix 1). Therefore, consumers will in general be more likely to choose sustainability-labeled products when the labeling visually communicates belongingness to a meta-sustainability labeling scheme than if an unconnected stand-alone single-issue label is used.

> **H1.** *Consumers are more likely to choose a product with a sustainability label when the label signals a belonging to a meta-sustainability label scheme compared to a traditional stand-alone single-issue label.*

The qualification of a single-issue label for meta-sustainability labeling can be visually communicated to consumers by (1) changing its design in accordance with a "family design" of a meta-sustainability labeling scheme or (2) by adding a separate meta-label. We expect that regardless of how the single-issue label's belonging to a meta-labeling scheme is visually communicated on a product, consumers are more likely to choose that product compared to the same product labeled with a traditional stand-alone single-issue sustainability label.

> **H1a.** *Consumers are more likely to choose a sustainability-labeled product if the label signals belonging to a meta-sustainability label scheme through a sustainability labeling family design.*

> **H1b.** *Consumers are more likely to choose a sustainability-labeled product if the label signals belonging to a meta-sustainability label scheme through the addition of a meta label.*

It seems likely that not all consumers will benefit equally from meta-sustainability labeling nor that they will value it equally. Hence, we expect that some people will value meta-sustainability labeling more than others. From the literature, we have identified three possible reasons for valuing meta-sustainability labeling: (1) a favorable evaluation of sustainability labeling, in general, leading to the belief that more sustainability labeling is better, (2) high knowledge of labeling leading to a better understanding of the limitations of current labeling and the benefits of sustainability labeling, and (3) feeling confused by the proliferating labeling landscape leading to a wish for measures that organizes and simplifies the labeling (Mitchell et al., 2005; Sharma et al., 2022; Thøgersen et al., 2010). On the one hand, one could imagine that consumers who are experts on sustainability labels or are very positive about current sustainability labels do not personally experience a need for improvements of the labeling system. On the other hand, their insight and attitudes may make them value changes that they believe will improve sustainability labeling and make such labeling more effective at achieving its goals. Also, consumers who feel confused by the current labeling landscape may value changes that make the labeling less confusing, such as meta-labeling. Hence, we propose that (1) consumer evaluation of sustainability labeling, (2) consumer labeling knowledge, and (3) consumer labeling confusion — three reasons for valuing meta-sustainability

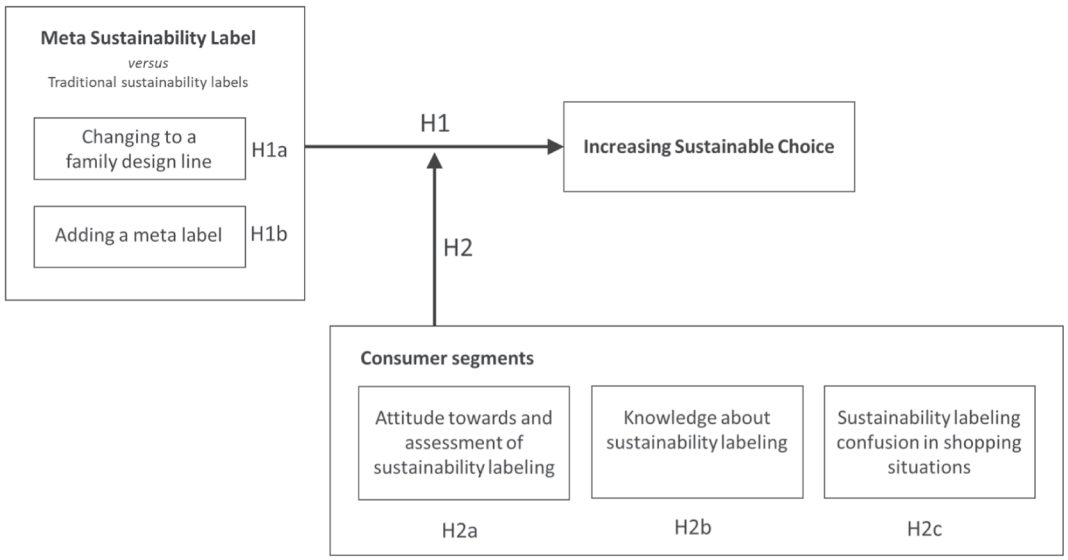

FIGURE 2 Theoretical model.

labeling — are likely moderators of its impact on consumer choices. Specifically, we hypothesize:

> **H2.** *Consumers who are more (a) favorable towards, (b) knowledgeable of, or (c) confused by traditional sustainability labels respond more favorably to any of the three mentioned ways of visual communication of the belongingness to a meta-sustainability labeling scheme.*

The hypotheses are summarized in the theoretical model in Figure 2.

3 | METHOD

3.1 | Data collection and sample

To study the effects of meta-sustainability labeling on consumer choices, we conducted a discrete choice experiment (DCE, see details in Appendix 2), that was embedded in an online between-subjects experiment and consumer survey in the United States (N = 518) and Germany (N = 520). We replicated the study in two countries to investigate the robustness of findings across countries and the extent to which responses to meta-sustainability labeling are country specific. The United States and Germany are similar in several regards. Both are affluent Western individualistic societies and important markets for sustainability-labeled products with a well-established sustainability labeling landscape (Delmas & Lessem, 2017; Lyon & Montgomery, 2015). Also, the likelihood of consumer confusion regarding labeling is relatively high in both countries due to the many different labels used and the abundance of labeled products carried by supermarkets. In addition, we assume that the existing branding of the Sustainable Development Goals (SDG) introduced by the United Nations is familiar to most consumers in these countries, which we take advantage of in our research design. Finally, the two countries are characterized by overlapping consumption patterns with regard to many product categories, including our case product: coffee (De Pelsmacker et al., 2005; Maaya et al., 2018).[1]

Data were collected in November 2020. The questionnaire was developed in English, translated into German, and back-translated. An ISO 27001-certified market research company, Qualtrics, handled the survey's administration, the sampling of the participants from their ESOMAR-approved partner panels, and the presentation of the data in SPSS files. Participants were informed about the study's aim and background and gave their written consent before participating in the study. The samples were drawn to be representative of the country in terms of gender, age (18 years old or more), and region. The samples' profiles on selected background characteristics are summarized in Appendix 3.

To ensure the participants perceived the key choice task as a natural one, they were screened to be at least partially responsible for their household's shopping and to have bought ground coffee or coffee beans in the past 12 months. The screening was deemed necessary because participants for whom the behavior in question is irrelevant are likely to either skip many questions or provide answers with low ecological validity (Thøgersen et al., 2019). In addition, we screened for response quality using two exclusion criteria: (1) Answering the survey in less than five minutes, and (2) answering an attention check question incorrectly ("It is important to pay attention to this survey, so please select 2 for this answer"). Before the choice experiment, we asked participants about the familiarity and visual appearance of the labels. After the choice experiment, we asked about

[1]See https://www.statista.com/topics/5363/coffee-market-in-germany/#dossierKeyfigures and https://www.statista.com/topics/1248/coffee-market/#dossierKeyfigures

attitudes and traits that could influence their responses and additional socio-economic background characteristics.

3.2 | Questions before the choice tasks

To level out prior (lack of) familiarity of the respective sustainability labels in the four experimental conditions, and especially to compensate for the lack of familiarity with the labels that were designed specifically for this study, we asked questions about familiarity and evaluation of the labels that were used for the choice experiment just before the choice experiment was conducted. We first presented a picture of the labels that were used in that experimental condition and then asked two questions on familiarity and one question on each label's visual appearance (see Appendix 4 and 5). Using a 7-point Likert scale, familiarity regarding the SDGs in general and the different labeling designs was measured by two items adapted from Yoo (2014): (1) "Have you seen [respective design] before?" and (2) "How familiar are you with [respective design]?" All twelve familiarity constructs (for SDGs and the individual labeling designs for each country) had excellent reliability (Cronbach's alpha > 0.90, except for one construct for which Cronbach's alpha > 0.80). The evaluation of the visual appearance of SDGs and the various labeling designs was measured by a single item adapted from Kim and Lakshmanan (2015): (1) "Do you like the visual appearance of [respective design]?", using a 7-point scale ranging from (1) "Dislike it a great deal" to (7) "Like it a great deal".

3.3 | The sustainable development goals as a family brand

The United Nations General Assembly presented the SDGs in 2015.[2] The SDGs are visually represented and promoted through 17 individual SDG icons and the SDG color wheel.[3] As such, the SDGs are an example of a family brand, where the joint design line signals that all icons belong together. The branding of the SDGs provides a unique opportunity to use the SDG design to replace existing sustainability labels and signal that they belong together in a sustainability labeling scheme (Del Río Castro et al., 2021), whereas the color wheel is used as a meta label (Torma & Thøgersen, 2021). Using the existing SDG branding as a point of departure for the design of new sustainability labels also has the advantage that the SDGs are already conceptualized as "a holistic approach that accounts for the numerous, interconnected dimensions of sustainability … to break down silos" (Mende & Scott, 2021, p. 120).

The SDGs have been promoted globally since 2015. In a 2019 survey of 19,517 adults across 28 countries, 74% had as a minimum heard of the UN's Sustainable Development Goals, and 26% claimed to be very or somewhat familiar with the SDGs (Boyon, 2019; Ipsos, 2019; Tedeneke, 2019). Further, whereas the guidelines for using the SDG logos are used to exclude any commercial purpose, the current guidelines allow restricted commercial use under specific circumstances (Sustainable Development Goals, 2019). This adds realism to the idea of using the SDG logos and wheel as a point of departure for meta-sustainability labeling.

A secondary, more practical reason for using an already established label design to test a common branding of sustainability labels and/or a meta label is the (saved) implementation time and costs of developing a new design or scheme (Prieto-Sandoval et al., 2016).

3.4 | The choice tasks and the label design

Participants were randomly assigned to one of four choice experiments, which were identical except for a different sustainability labeling design (see Table 1).

In condition one, the *traditional labeling*, we used established versions of the national organic label (Janssen & Hamm, 2014) and the Fairtrade label. In condition two, the *family labeling*, we created new designs of the organic and the Fairtrade label based on the SDG design. Condition three, the *traditional plus meta*, was identical to condition 1 except that we added a meta label (the color wheel, also based on the SDG design). Condition four, the new *family label plus meta*, was identical to condition 2, but again with the added meta label.

In addition to (1) labeling, we varied (2) country of origin (COO), (3) roasting, and (4) price of the coffee. Sustainability labeling had two levels: labeling (the labels used in the respective condition) or no labeling. The country of origin was either Colombia or Ethiopia, which are popular origins for coffee in both the United States and Germany. Roasting was either dark roasted or medium roasted. The price had three levels: the regular price of conventional coffee in the country, 20% lower, or 20% higher (see Table 1).

With $2 \times 2 \times 2 \times 3$ levels, these attributes can be combined in 24 different ways. We chose to include three alternatives in each choice set (plus the option to not choose any of the three alternatives). The number of different sets of three products that can be created from these 24 options is 2024 (n! / [m! * (n-m)!], where $n = 24$ and $m = 3$). Therefore, we used SAS JMP to calculate an efficient fractional factorial design based on the principles of minimum overlap and level balance and set the number of repeated choices to eight. Participants were presented with the eight choice sets in random order. The product presentation included a picture of a generic bag of coffee and a cup of coffee. An example choice set from each country is shown in Appendix 6.

3.5 | Statistical method

We based the analysis of how the alternatives' characteristics influenced participants' (stated) preferences on random utility theory, using an extended multinomial logit model (MNL), which allows the

[2] https://sustainabledevelopment.un.org/sdgs (accessed 12 Oct 2020).
[3] https://sdgs.un.org/goals.

TABLE 1 Attributes and attribute levels in the choice experiment.

Attribute	Levels	USA	Germany
Label	Label	Traditional 	Traditional 
		New design 	New design 
		Traditional + meta label 	Traditional + meta label 
		New design + meta label 	New design + meta label 
	No label		
Country of origin	Colombia	Colombia	Kolumbien
	Ethiopia	Ethiopia	Äthiopien
Roasting	Dark	Dark roasted	Dunkle Röstung
	Medium	Medium roasted	Mittlere Röstung
Price	Low	$6.27 per lb	6,65 € per 500 g
	Medium	$7.84 per lb	8,31 € per 500 g
	High	$9.40 per lb	9,98 € per 500 g

inclusion of the alternatives' characteristics as explanatory variables (McFadden, 1974). The model was estimated by means of Latent Gold Choice 5.1 (LGC) (Vermunt & Magidson, 2016).

For the study of preference heterogeneity and response patterns, LGC uses a latent class (LC) or finite mixture structure employing a non-parametric variant of the random-coefficient or mixed conditional logit model (Andrews et al., 2002; Vermunt & Magidson, 2016). We use this procedure to identify participants whose choices are not related to the alternatives' attributes at all but seem to be random (Vermunt & Magidson, 2016). We interpret this type of response as a type of "mischievous responding" (Hyman & Sierra, 2012). Random responders can be modeled as a separate latent class for whom the utilities of all levels of each attribute are equal (Vermunt & Magidson, 2016). Prior research has found that the proportion of random responders can be quite substantial, leading to biased parameter estimates if not controlled (Grunert et al., 2015). Therefore, a separate "random responders" class was specified in all models reported in the following.

3.6 | Questions after the choice tasks

Questions that we judged might potentially bias the participant's choices in the choice experiment were placed after the choice experiment, such as how favorably they evaluated sustainability labeling (conceptualized as attitude and usefulness), subjective knowledge about sustainability labeling, and feelings of confusion regarding sustainability labeling in shopping situations (conceptualized as ambiguity, overload, and similarity confusion).

The attitude towards sustainability labeling was measured by three items 7-point semantic differential scale adapted from Lehnert et al. (2014): "To me the sustainability labels were" (1) meaningless – meaningful, (2) useless – useful, and (3) insignificant – valuable. The three items form a construct with excellent reliability in both countries (Cronbach's alpha > 0.90).

The perceived usefulness of the sustainability labeling was measured by three items adapted from Park and John (2014), using a 7-point Likert scale: (1) "The sustainability labels enable me to accomplish shopping tasks more quickly", (2) "The sustainability labels enhance my effectiveness in my shopping tasks", and (3) "The sustainability labels make it easier to do my shopping tasks". The three items form a construct with excellent reliability in both countries (Cronbach's alpha > 0.90).

Subjective knowledge regarding sustainability labeling was measured by three items adapted from Thøgersen et al. (2010), using a 7-point Likert scale: (1) "I know quite a lot about sustainability labeling," (2) "I am one of the experts on sustainability labeling among my acquaintances," and (3) "I feel well-informed about sustainability labeling." The three items form a construct with excellent reliability in both countries (Cronbach's alpha > 0.90).

Confusion towards sustainability labeled food products in shopping situations was measured based on three confusion categories

adapted from Walsh and Mitchell (2010): ambiguity confusion, overload confusion, and similarity confusion. A 7-point Likert scale was used. The items measuring ambiguity confusion were: (1) "Food products often have so many features that a comparison of different sustainability labels is barely possible", (2) "The information I get from sustainability labels is often so vague that it is hard to know how a product actually performs", (3) When buying a food product I rarely feel sufficiently informed about its sustainability features", (4) "When buying certain food products, I feel uncertain about which sustainability features are particularly important for me", and (5) "When buying certain food products, I need further help to understand differences between sustainability labels." The five items form a construct with excellent reliability in both countries (Cronbach's alpha > 0.80). The four items measuring overload confusion were as follows: (1) "I do not always know exactly which sustainability labels to rely on when choosing products", (2) "There are so many sustainability labels to choose from that I sometimes feel confused", (3) "Owing to the many sustainability labels, it is sometimes difficult to decide which one to focus on", and (4) "Many sustainability labels are very similar and are therefore hard to distinguish." The four items form a construct with excellent reliability in both countries (Cronbach's alpha > 0.80). The three items measuring similarity confusion were as follows: (1) "Owing to the similarity of many sustainability labels it is often difficult to detect new sustainability labels", (2) "Some sustainability labels look so similar that it makes me uncertain whether they are verified by the same organization or not", and (3) "Sometimes I want to buy a food product labeled with a sustainability label seen in an advertisement, but cannot identify it clearly between the many similar labels." The three items form a construct with excellent reliability in both countries (Cronbach's alpha > 0.80).

The mean values and standard deviations of these potential moderators are presented for each country in Appendix 5. Overall, the US and German participants do not differ in attitudes towards sustainability labels. However, US participants perceive themselves as slightly more knowledgeable of and, according to some items, less confused regarding sustainability labeling than the German participants, and they tend to find sustainability labeling slightly more useful.

4 | RESULTS

We first report how the different labels were perceived regarding familiarity and visual appearance in the Unites States and Germany. Next, we analyze choices in the US and German samples, reporting similarities and differences between the two countries in how labeling, COO, roasting, and price influence the choice of coffee, aggregated over the four labeling conditions. Then we investigate possible differences in how labeling effects participants' choices between the four different label conditions, which is the primary aim of this study. Finally, possible moderators of differences in how labeling effects participants' choices between the four different label conditions are investigated.

4.1 | Consumer awareness of and attitude toward the various label designs

The level of familiarity and evaluation of the visual appearance of the different labels in each country are presented in Table 2. The traditional Fairtrade label is less familiar in the Unites States than in Germany (3.29 vs. 5.70, $p < .001$) and also less liked (4.79 vs. 5.59, $p < .001$). Due to an error in the design of the questionnaire, we did not obtain measures of the familiarity and evaluation of the traditional organic label in Germany and, hence, cannot compare it between the two countries. In the Unites States, the traditional organic label is very familiar and liked, and more so than the traditional Fairtrade label (familiarity: 4.90 vs. 3.29, $p < .001$, liking: 5.39 vs. 4.79, $p < .001$). Secondary data also suggests a very high familiarity of the traditional organic label in Germany (see the note to Table 2).

In both countries, the new labels that we designed for this study are perceived as unfamiliar (i.e., means below the midpoint of the 7-point scale), especially in Germany. However, in both countries, the new labels are positively evaluated in terms of visual appearance (i.e., means above the midpoint of the 7-point scale), and more so in the Unites States (the new organic label and meta label). Also, the Sustainable Development Goals' overall branding is perceived as more familiar and liked in the United States than in Germany (familiarity: 3.00 vs. 2.54, $p < .001$, liking: 5.11 vs. 4.74, $p = .001$).

In sum, as should be expected, the new label design is perceived as less familiar than the traditional design. On a country-level, the traditional labeling appears to be more positively evaluated in Germany, whereas the new design is more positively evaluated in the Unites States. Differences between the traditional and the new Fairtrade label regarding familiarity and visual appearance are presented for each country in Appendix 7. In the Unites States, both designs were perceived as similarly familiar and liked, whereas in Germany the traditional Fairtrade label was perceived as significantly more familiar and liked than the new Fairtrade label design. Together with the differences reported in Table 2, this suggests that the traditional labels have a stronger position in the minds of consumers in Germany than in the United States.

4.2 | Similarities and differences in consumer preferences and choices between countries

The country-level results of the choice experiments, corrected for "random responders," are presented in Table 3. In both countries, the share of the sample making random choices is 11%, which is within the range found in other studies (e.g., Grunert et al., 2015; Thøgersen et al., 2019; Thøgersen & Alfinito, 2020). Also, in both countries, the fit of the model is improved by adding a random responder class as reflected in a substantial drop in BIC (LL) (US from 9686.0216 to 9362.1781; Germany from 8440.8719 to 8162.4911).

Attributes with only two levels are coded as dummy variables, which means that the reference category (no label, Ethiopia, medium roast) is set to 0; the price is coded as continuous and, hence, its

TABLE 2 Familiarity and visual appearance of the different labels for each country, mean values, and standard deviations (in parentheses).

Items, mean (SD) n	USA 518	Germany 512	t	p
Familiarity - sustainable Development goals				
Have you seen these visuals of the sustainable Development goals before?	2.94 (2.21)	2.24 (1.79)	5.57	< .001
How familiar are you with the sustainable Development goals, developed and introduced by the United Nations?	3.00 (2.26)	2.54 (1.68)	3.79	< .001
visual appearance - sustainable Development goals				
How much do you like the visual appearance of the labels used to represent the sustainable Development goals?	5.11 (1.72)	4.74 (1.72)	3.46	.001
Familiarity - traditional labeling	*257*	*256*		
Have you seen this label before? *- organic* *- Fairtrade*	5.19 (1.98) 3.33 (2.19)	[a] 5.87 (1.74)	N/A −14.52	N/A < .001
How familiar are you with this label? *- organic* *- Fairtrade*	4.90 (2.03) 3.29 (2.13)	[a] 5.70 (1.76)	N/A −13.96	N/A < .001
Visual appearance - traditional labeling	*257*	*256*		
Do you like the visual appearance of this label? *- organic* *- Fairtrade*	5.39 (1.55) 4.79 (1.61)	[a] 5.59 (1.51)	N/A −5.77	N/A < .001
Familiarity – New design	*261*	*256*		
Have you seen this label before? *- organic* *- Fairtrade*	3.47 (2.21) 2.90 (2.22)	2.16 (1.74) 2.75 (2.22)	7.47 0.79	<.001 .430
How familiar are you with this label? *- organic* *- Fairtrade*	3.43 (2.26) 2.94 (2.28)	2.14 (1.68) 2.83 (2.24)	7.33 0.54	<.001 .592
Visual appearance – New design	*261*	*256*		
Do you like the visual appearance of this label? *- organic* *- Fairtrade*	5.34 (1.54) 5.00 (1.82)	4.64 (1.67) 4.72 (1.85)	4.97 1.72	<.001 .086
Familiarity – Meta label	*260*	*255*		
Have you seen this label before?	2.57 (2.13)	1.62 (1.27)	6.17	< .001
How familiar are you with this label?	2.60 (2.17)	1.60 (1.24)	6.36	< .001
Visual appearance – Meta label	*260*	*255*		
Do you like the visual appearance of this label?	4.61 (1.92)	3.98 (1.92)	3.68	< .001

Note: Measures on familiarity and visual appearance were all on a 7-point scale from (1) 1 = Definitely never seen to 7 = Have seen it many times; (2) 1 = Very unfamiliar to 7 = Very familiar; (3) 1 = Dislike it a great deal to 7 = Like it a great deal.

[a]Measures on the familiarity and visual appearance for the German organic label are not available due to an error in the design of the questionnaire. Statistical data from July 2017 suggest that the German organic label is well known in Germany where 86.4% stated that they know the label, see https://de.statista.com/statistik/daten/studie/705842/umfrage/umfrage-zur-kenntnis-von-bio-siegeln-in-deutschland/.

coefficient is the slope, showing the utility effect of an increase in price from low to medium or medium to high. The relative importance of an attribute for participants' choices is reflected in the span between the highest and lowest coefficient for levels of an attribute (Peschel et al., 2016; Vermunt & Magidson, 2016). Overall, labeling and price appear to make the biggest difference for participants in both countries when choosing among the alternatives offered, labeling being slightly more important than the price in the United States (.38 vs. .34), and the price being slightly more important than labeling in Germany (.43 vs. .47). Country of origin and roasting, and especially roasting, appear to be less important to participants. Note, however, that the relative importance of attributes calculated this way depends on the alternatives offered (e.g., the actual COO included, the price range).

In both countries, participants prefer sustainability-labeled, medium-roasted coffee from Colombia at the lowest price. Hence, most participants prefer a sustainability-labeled product over a non-labeled product. The included product attributes account for

TABLE 3 Multinomial logit model estimates for the choice of coffee, USA (n = 518), and Germany (n = 512), controlling for random responders[a].

Variables	USA $R^2 = 0.18$[b]			Germany $R^2 = 0.30$[b]		
	B	z-value	Rel. Im-portance[c]	B	z-value	Rel. Im-portance[c]
Labeling			0.38			0.43
Label	0.81	20.38***		1.52	30.60***	
No label						
Country of origin			0.20			0.06
Colombia	0.43	11.47***		0.22	5.06***	
Ethiopia						
Roasting			0.10			0.04
Dark roasted	−0.20	−5.45***		−0.14	−3.58***	
Medium roasted						
Price			0.34			0.47
Per unit[d]	−0.36	−14.61***		−0.89	−28.33***	
None	−2.84	−17.94***	-	−2.80	−18.61***	-

[a]Results for random responders are omitted because their parameter values are fixed to zero, by definition. The proportion of random responders, estimated by means of latent class analysis: US: 0.11; Germany: 0.11.
[b]R^2 for Class 1 (the "non-random responders").
[c]The relative importance of product attributes in the choice experiment, leaving "none-of-these" out of the calculation.
[d]The price unit in this study is a price difference of 20%.
***p < .001.

substantially more variance in choices among the German than among the US participants. Also, German participants weigh the price relatively more than US participants, who weigh the COO relatively more (see Table 3).

4.3 | Effects of label design

In the next step, we extended the model reported in Table 3, adding two-way interactions between labeling and label conditions.[4] These analyses reveal that US participants were, in general, more sensitive to the labeling manipulation than the German participants (Table 4).

In the US sample, there is a significant interaction between labeling and label conditions (Wald = 10.49, 3 df., p = .015). The effect of the labeling is higher in condition 2 (new family design) and condition 4 (new family design + meta label) than in condition 1 (traditional) and condition 3 (traditional + meta label). This is consistent with the hypothesized (1a) positive impact of a new family label compared to the traditional stand-alone single-issue label. However, Hypothesis 1b is not confirmed. It appears that adding a meta label – in the form of the SDG rainbow circle – to either the traditional or the new family design reduced the effect of the labeling. Also, Hypotheses 1a and 1b are not confirmed in Germany, where the interaction between labeling and label conditions is not significant (Wald = 1.67, 3 df., p = 0.64). Hence, in the German context, which is characterized by a stronger preference for sustainability labeling and a higher level of familiarity and positive attitude towards the traditional labels than in the United States, participants did not respond more favorably to any of the meta-label scheme conditions. Hence, in a German context, changing the traditional labeling into a new family label design or adding a meta label apparently does not further improve (but also does not seem to harm) the already very favorable consumer responses to the labeling. In the following, we investigate possible contingencies of the effects of labeling and especially meta-labeling on participants' choices.

4.4 | Moderators of labeling effects

We investigated the moderation effect of three possible contingencies of the different effects of the four different label conditions on participants' choices: evaluation of, perceived knowledge about, and feelings of confusion about sustainability labeling. We found significant moderation effects at the conventional level in Germany, but not in the United States, confirming Hypothesis 2 for Germany, but not for the United States. Regression parameters and Wald tests of direct and interaction effects are reported for the German sample in Table 5.[5]

[4]We also estimated models including interactions between the other attributes and the different label conditions. As expected, they were not significant. The LGC output from these calculations can be acquired from the second author.

[5]The output of the calculations based on the US sample can be obtained from the second author.

TABLE 4 Multinomial logit model estimates for the choice of coffee, USA (n = 518), and Germany (n = 512), with direct attribute effects and interaction with labeling conditions, controlling for random responders[a].

Variables	USA $R^2 = 0.18$[b] B	z-value	Germany $R^2 = 0.30$[b] B	z-value
Labeling				
Label	0.81	20.43***	1.52	30.54***
No label				
Country of origin				
Colombia	0.43	11.46***	0.22	5.07***
Ethiopia				
Roasting				
Dark roasted	−0.20	−5.46***	−0.15	−3.60***
Medium roasted				
Price				
Per unit[c]	−0.36	−14.58***	−0.89	−28.32***
None	−2.85	−18.14***	−2.79	−18.53***
Interactions with labeling				
Condition 1 (traditional)	−0.08	−1.21[ns]	0.07	0.37[ns]
Condition 2 (new design)	0.20	2.91**	−0.06	0.46[ns]
Condition 3 (traditional + meta)	−0.13	−2.05*	0.04	0.56[ns]
Condition 4 (new design + meta)	0.01	0.19[ns]	−0.05	0.46[ns]

[a]Results for random responders are omitted because their parameter values are fixed to zero, by definition.
[b]R^2 for Class 1 (the "non-random responders").
[c]The price unit in this study is a price difference of 20%.
ns = not significant,
*p < .05,**p < .01,***p < .001.

First and foremost, the responses to the different labeling designs are moderated in the same way by all three types of labeling confusion (although the moderating effect of ambiguity confusion is only marginally significant). It appears that the more confused German consumers feel about the current situation with regard to sustainability labeling, the more they seem to appreciate attempts to integrate the different types of labeling. Both the family design line and adding the meta label increased the effect of labeling on choices for the most confused, and the combination of the two worked best.

In addition, a significant interaction was found between labeling conditions and subjective knowledge about sustainability labeling. Specifically, the family design improved the effectiveness of the labeling among those with high subjective knowledge. Adding the meta label only produced a small positive effect among those with high subjective knowledge and detracted from the effectiveness of the labeling when combined with the family design.

Finally, a significant interaction was found between labeling condition and attitude towards sustainability labeling, and between labeling condition and the perceived usefulness of sustainability labeling. Participants with a highly favorable perception of and attitude towards sustainability labeling responded favorably to adding a meta label to the traditional labels. The family design of the individual labels, with or without the meta label, only slightly improved the effectiveness of labeling for participants with above-average attitudes and perceptions regarding sustainability labeling.

In sum, for some consumer segments in Germany, changing qualified sustainability labels into a family design and/or adding a meta label led to a significant increase in the effectiveness of sustainability labeling. Especially, there is a positive effect of both means to integrate and harmonize sustainability labeling among consumers who feel more confused by current sustainability labeling in shopping situations (ambiguity, overload, and similarity confusion). Hence, for the more confused German consumers, changing qualified sustainability labels into a family design plus adding an accompanying meta label seems to significantly increase the utility of sustainability labeling. Also, consumers with more favorable attitudes towards and perceptions about sustainability labeling (especially) appreciate adding a meta label, whereas consumers that feel very knowledgeable about sustainability labeling (especially) appreciate an integrating family design, similar to a family brand.

5 | DISCUSSION AND CONCLUSION

Some researchers believe that meta-sustainability labeling has the potential to improve the benefits of sustainability labeling from a consumer point of view, whereas others believe it will just increase confusion. However, until now this has mostly been a theoretical discussion since past research has offered little empirical evidence on this topic, despite its importance increasing with the proliferation of

TABLE 5 Analyses of interactions with potential moderators in the German sample and a class of random responders[a].

	Perception of sustainability labeling (SL)[b]				Subjective knowledge about SL[b]		SL confusion in shopping situations[b]					
	Attitude towards SL		Usefulness of SL		Subjective knowledge		Ambiguity confusion		Overload confusion		Similarity confusion	
Variables	**B**	**Wald[c]**	**B**	**Wald[c]**	**B**	**Wald[c]**	**B**	**Wald[c]**	**B**	**Wald[c]**	**B**	**Wald[c]**
Labeling												
Label	1.64	792.08***	1.66	851.36***	1.75	864.36***	1.55	939.22***	1.57	951.64***	1.53	974.16***
No label												
country of origin												
Colombia	0.27	33.10***	0.26	31.86***	0.25	30.14***	0.23	26.68***	0.22	26.19***	0.22	26.39***
Ethiopia												
roasting												
Dark roasted	−0.14	10.47**	−0.13	10.18**	−0.15	12.33***	−0.15	12.89***	−0.14	12.76***	−0.15	13.01***
Medium roasted												
Price												
Per unit[d]	−0.97	651.39***	−0.93	715.48***	−0.95	748.42***	−0.90	807.89***	−0.90	819.71***	−0.90	831.15***
None	−3.05	598.99***	−2.95	615.94***	−2.99	503.37***	−2.80	599.17***	−2.78	597.30***	−2.76	606.80***
Interactions, condition & labeling		0.97[ns]		0.01[ns]		4.20[ns]		1.22[ns]		1.91[ns]		1.55[ns]
Condition 1 (traditional)	−0.05		−0.00		−0.07		0.03		0.06		0.07	
Condition 2 (new design)	0.08		0.01		0.20		0.01		0.02		−0.04	
Condition 3 (traditional + meta)	−0.02		−.0.00		−0.05		0.03		0.02		0.03	
Condition 4 (new design + meta)	−0.01		−0.00		−0.08		−0.08		−0.10		−0.06	
Direct effect of moderator	0.87	282.53***	0.80	271.51***	0.72	135.07***	−0.25	29.43***	−0.26	32.28***	−0.18	15.83***
Interactions, moderator & labeling		12.79**		15.38**		10.36*		7.46 +		20.73***		18.37***
Condition 1 (traditional)	−0.22		−0.22		−0.25		−0.11		−0.22		−0.25	
Condition 2 (new design)	0.04		−0.10		0.29		−0.14		−0.17		−0.07	
Condition 3 (traditional + meta)	0.25		0.28		−0.11		0.10		0.12		0.05	
Condition 4 (new design + meta)	−0.08		0.04		0.07		0.15		0.28		0.27	

[a]Results for random responders are omitted because their parameter values are fixed to zero, by definition.
[b]Each moderator is represented as the standardized mean of the items used to measure it.
[c]ns = not significant
[d]One price unit in this study is a price difference of 20%.
+p < .10,
*p < .05,**p < .01,***p < .001.

sustainability labeling. Therefore, this article's main objective has been to provide empirical evidence on how consumers respond to meta-sustainability labeling. Specifically, we have investigated the impact of communicating that a single-issue sustainability label belongs to a meta-sustainability labeling scheme, and of different ways of visually communicating this, on consumer choices. This was done in a comparative study of US and German consumers' choices when buying coffee beans or ground coffee that vary regarding typical product attributes and price. For this purpose, participants were randomly allocated to four different sustainability labeling conditions.

Overall, in both countries, sustainability labeling appears to be important for consumer (coffee) product choices, compared to the other varied product characteristics, and to be an effective means to facilitate more sustainable consumer choices. This is consistent with prior research, both regarding coffee (e.g., Birkenberg et al., 2021; M.-F. Chen, 2020; Hainmueller et al., 2015; Thøgersen & Nielsen, 2016) and other products (e.g., Bradu et al., 2014; Ní Choisdealbha & Lunn, 2020; Thøgersen et al., 2019). To test if meta-sustainability labeling would increase or decrease the effects of sustainability labeling on sustainable product choices, we compared traditional sustainability labeling to three different ways of communicating the qualification for a meta-sustainability labeling scheme: (1) changing qualified traditional sustainability labels into a family design, (2) adding a meta label to traditional sustainability labels, or (3) both.

In the United States, we found that meta-sustainability labeling outperformed traditional labeling (confirming Hypothesis 1). However, whereas changing qualified sustainability labels into a family design led to a significant increase in the choice of sustainability-labeled products (confirming Hypothesis 1a), adding a meta label had no effect (rejecting Hypothesis 1b). Even though the new design was less familiar than the traditional design – something which we could only compensate for in a limited way in the study – participants in the United States appeared to appreciate meta-sustainability labeling in the form of a family design for qualified traditional sustainability labels. However, adding an accompanying meta label seems to have no value to US consumers, confirming some scholars' predictions (e.g., Eberle et al., 2011; Ge & Brewster, 2016; Tobi et al., 2019).

In Germany, the different label designs did not lead to significantly different effects of sustainability labeling at the aggregate level. This could be due to the high relative importance of sustainability labeling in Germany, for example, compared to the United States, which might have led to a "ceiling effect," and/or to lower sensitivity to the design of the labeling among German compared to US participants. Another possible reason why the specific design of meta-sustainability labeling had less effect in the German than in the US sample is that the SDGs appear to be less familiar in Germany than in the United States. Whatever the reason, both the country differences and the found moderation effects show that companies need to differentiate their marketing communication to target different consumer groups (Sun et al., 2021). As noted by Janssen and Hamm (2012, p. 446) regarding organic labeling in Germany, "different consumer segments preferred different … labels." In Germany, we identified consumer segments that differ significantly in how they respond to label designs due to differences in the evaluation of sustainability labeling, labeling confusion, and label knowledge (Hypothesis 2). German consumers with a more positive evaluation of sustainability labeling appreciate when the traditional labeling is accompanied by a meta label (confirming Hypothesis 2a), and consumers with high subjective knowledge on sustainability labeling appreciated a family design for the single-issue labels (confirming Hypothesis 2b). One can speculate that since German consumers are in general well accustomed to the established sustainability labeling landscape in the country (Janssen & Hamm, 2012), they are not as against improving the sustainability labeling system. However, it appears from these results that only those that are most attitudinally engaged in or knowledgeable about sustainability labeling appreciate the advantages of adding a meta label or of harmonization by means of a family label design.

Another important segment is consumers who are confused by the current sustainability labeling landscape. In Germany, this segment in general reacted favorably to both tested improvements in terms of making the sustainable choice clearer and simpler. Here, the most effective type of sustainability labeling for this segment was a family design with the addition of a meta label to the single-issue sustainability labels (confirming Hypothesis 2c). In sum, it appears that a visually communicated meta-sustainability labeling scheme does no harm and, in some contexts and for some consumer segments, it might help. It outperforms traditional labeling in general in the United States and among some consumer segments in Germany — those who are most confused by the current sustainability labeling landscape, and those who are most positive towards and/or knowledgeable about sustainability labeling in general. These moderation effects were not significant in the US sample (rejecting Hypothesis 2 in the US), perhaps because of higher subjective knowledge of sustainability labeling lower feeling of confusion than in Germany.

5.1 | Limitations and future research

We used hypothetical choices to estimate the impacts of meta-sustainability labeling, which implies a risk of biased responses, although arguably less so than the response scales most often used in surveys (Auger & Devinney, 2007). Also, in a discrete choice experiment, participants are only exposed to a limited number of attributes and levels. On the one hand, this, and the absence of many distractions in the choice situation, might lead to unrealistically high attention towards the included attributes compared to a real shopping environment. On the other hand, consumers only attend to a very limited number of salient attributes and levels when choosing fast-moving consumer goods, such as coffee (Thøgersen et al., 2012), and we carefully chose the attributes to match a realistic choice situation of the product in question.

Whereas the included single-issue labels have been used in the German and US markets for a long time, the tested meta label and the family design were unknown to participants beforehand. To investigate consumer preferences with regard to a range of label alternatives

of which several have not yet been introduced to the consumer, stated preference data is widely used and acknowledged as a useful method (Bliemer & Rose, 2014; Louviere et al., 2010). To compensate for the lack of familiarity with the new labels, we used a design line that was familiar to participants from other contexts (i.e., the UN SDG labels) and we included pictures of the labels and a few questions designed to make participants pay attention to and reflect on the labels just before the choice experiment. Thereby, we hoped to create at least situational familiarity with the unknown labels. Still, these measures are unlikely to fully compensate for the difference in familiarity between the new and the traditional designs. Also, presenting and asking participants about familiarity with and visual appearance of the labels before the choice experiment may have made participants pay more attention to the labels when making product choices and, hence, led to an upward bias in the importance of the sustainability labeling. However, there is no reason to expect that this potential bias should differ between labeling conditions. Future research might include additional control conditions, including a "random" and completely unknown meta label and/or a meta label alone, without single-issue sustainability labels.

Another limitation is that we only tested the new labels with one product and in two countries. The found country differences in sensitivity to labeling effects suggest a need to investigate more systematically which country characteristics, including possible cultural differences in survey response patterns, moderate the effects of meta-sustainability labeling and whether these effects also differ across products. Specifically, future research should investigate the context-dependence of the reported findings in more detail to obtain a more precise answer regarding when, how, and how much meta-sustainability labeling can reduce consumer labeling confusion.

More research is also needed to further explore the unique opportunity for branding a meta-sustainability labeling scheme created by the visual branding of the SDGs. The common family design of the 17 SDGs and the uniting rainbow color wheel is heavily marketed worldwide and seems an obvious basis for sustainability labeling. Recently, the regulation extended its free potential use from only non-commercial to restricted commercial use (Sustainable Development Goals, 2019). However, so far, the focus has been on informing and engaging people, businesses, and organizations worldwide in reaching the SDGs. To the best of our knowledge, this is the first research utilizing the SDG branding for sustainability product labeling.

5.2 | Conclusion and implications for praxis

For consumers to make sustainable consumption choices, credible information on a product's sustainability – a credence attribute – needs to be available at the point of purchase. Product labeling is a common, convenient, and popular way to achieve this. Therefore, it is a good thing that new sustainability labels are introduced where they are missing to address relevant sustainability goals. However, there is a risk that sustainability labels become too numerous, too ambiguous, and too similar, and therefore increase consumer confusion and reduce the helpfulness and effectiveness of labeling. Furthermore, stand-alone, single-issue sustainability labels risk distracting consumer attention from other important, but unrepresented sustainability dimensions.

As pointed out by Reinecke et al. (2012), "meta-standardization" offers the potential to overcome many and different individual standards to reach common ground on the key overarching principles of single-issue sustainability labels. Hence, meta-sustainability labeling has the potential to disseminate quality information about sustainability in an overarching, interconnected, and easily comprehensible way. Also, it is encouraging that including unfamiliar meta-labeling did not make participants in this study respond less favorably to sustainability labeling than when familiar labels were used alone. However, to justify the extra costs of a meta-sustainability labeling scheme, it should add value to consumers and facilitate more sustainable consumer choices than existing labeling practice. Hence, it is important to thoroughly test how consumers perceive and respond to any new label design or a meta-label, including how they affect choices. Since it takes time to build familiarity of new label designs, this should be reflected in test designs. To make more precise prognoses for the likely trajectory of familiarity and other response variables over time, research is needed on typical diffusion curves for sustainability labels (Thøgersen, 2002).

This study has provided the first empirical evidence on the perceived value and usefulness of a meta-sustainability label to drive sustainable consumer choices. Prior research has shown successful sustainability labeling requires the sufficient promotion of the labeling scheme and consumer receptiveness of and trust in the offered information, and also producers' and retailers' willingness to adopt a new sustainability labeling scheme if it is not mandatory (Thøgersen, 2002). Some companies shy away from labels directed at consumers among other things because they fear it would lead to higher public scrutiny, which might lead to negative attention towards sustainability aspects that are not covered by the labeling, and which is less likely if they use business-to-business labels, such as GlobalGAP (Mook & Overdevest, 2021).

Both regarding the promotion of the labeling scheme and managing the risk of negative publicity due to uncovered aspects, building a new meta-sustainability labeling on the UN SDG framework is promising. The many campaigns aiming to inform the public and raise awareness about the SDGs are likely to gradually increase the public's familiarity with and knowledge of both the diversity of sustainability goals and their graphical branding. And using meta-labeling based on this framework will help companies communicate their broad commitment to the sustainability goals in a credible way. Several companies already provide certification of compliance with the SDGs,[6] which is required for using the SDGs for labeling purposes, and documents the practical relevance of using exactly this graphical expression for sustainability meta-labeling.

[6] https://www.bureauveritas.dk/en/certification-basis-and-criteria-certification-towards-17-goals

In sum, there is an untapped potential for integrated meta-labeling of several sustainability dimensions based on the SDG branding, with a special focus on more responsible consumption and production (Scott et al., 2022). This study shows that in some contexts and for some consumer segments, such meta-labeling will increase the effectiveness of sustainability labeling with relatively limited requirements in terms of supporting campaigns. In other contexts and for other segments, it may take longer time to build the familiarity and confidence needed to obtain the full labeling effect, but at least we found no indications of the negative effect feared by some (Eberle et al., 2011; Ge & Brewster, 2016; Tobi et al., 2019). Furthermore, the use of SDG branding supports a global perspective on sustainability labeling, reflecting the global scope and scale of sustainable marketing and policy, and entailing both potential benefits and challenges on the global marketplace (Shultz et al., 2022). Hence, we hope that this and future research will facilitate more effective use of visually communicated meta-sustainability labeling as a tool for sustainable transformations in the marketplace.

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APPENDIX 1

Conceptualizing consumer confusion

Consumer confusion regarding the environmental features of a product or service has been defined as "consumer(s) failure to develop a correct interpretation of environmental features of a product or service during the information processing procedure" (Turnbull et al., 2000, p. 145), which refers to an "objectively correct" understanding of sustainability labeling. However, in daily life, confusion is often understood "subjectively" as the feeling of confusion. In the shopping environment, three types of consumer confusion sources have been distinguished: misleading or ambiguous information, information overload, and brand similarity (Mitchell et al., 2005).

Building on this classification and the work of Moon et al. (2017), we propose three types of consumer confusion in the context of sustainability labeling:

Label ambiguity confusion (unclear information) occurs when the consumer experiences unclear or misleading information on sustainability labels. Ambiguity creates a need for the consumer to re-evaluate and revise beliefs or assumptions about a label or labels. In contrast, clarity and understanding of a label are enhanced when perceived as unambiguous and clear information regarding the product's sustainability performance.

Label overload confusion (too much information) is caused by the consumer being confronted with too much information and an overly selection-rich environment with too little processing time available to fully understand, and be confident in, the relevant labels. In contrast, clarity and understanding of a label are enhanced when it is perceived as simple information on the product's sustainability performance that reduces or eliminates the need to process and understand a multitude of unconnected pieces of information (including single-issue sustainability labels).

Label similarity confusion (too similar information) we define as a lack of understanding and potentially incorrect label interpretation caused by the perceived design similarity of different and unconnected product labels or (usually less serious) multiple labels providing the same or similar information (e.g., a product being labeled with two organic labels, such as the national and the European organic label). In contrast, clarity and understanding of a label are enhanced when it is perceived as an overall, clearly distinguishable cue to the overall sustainability performance of the product that reduces or eliminates the difficulty of distinguishing between multiple single-issue sustainability labels.

Meta Sustainability Labeling reducing ambiguity confusion. Traditional, single-issue labels lack an overall perspective on sustainability. Concerning the UN's Sustainable Development Goals, existing environmental, social, and ethical labels are typically limited to only one or a subgroup of the possible goals. Generally, sustainably-involved consumers are attentive to the UN's SDGs' societal issues and are positive towards solutions to these issues (Weber, 2017).

However, even these consumers may experience label ambiguity confusion when exposed to single-issue sustainability labels because they cannot assess a labeled product's overall sustainability performance. "Waterbed effects" and greenwashing attempts are serious threats within the existing sustainability label landscape, which consumers cannot easily identify and avoid (Engels et al., 2010; Golden et al., 2010; Schlegel et al., 2008).

Waterbed effects among sustainability dimensions appear when a product is beneficial in terms of one sustainability dimension but detrimental for other sustainability dimensions. For example, buying locally may be beneficial in terms of climate impacts of transportation but detrimental for the goal of reducing poverty in exporting countries. Hence, products carrying a sustainability label may be unsustainable in other dimensions. Besides, due to their single-issue focus, current sustainability labels can fragment the sustainability concept in consumers' minds, with the different sustainability issues being decoupled and perceived as unrelated (Reisch et al., 2013). This can lead to label competition, where sustainability labels compete for consumer attention (Eberle et al., 2011; Schebesta, 2016).

"Greenwashing" refers to misleading claims that the consumer cannot assess at the point of purchase (Parguel et al., 2011; Rahman & Nguyen-Viet, 2022). "Green" itself is an example of a vague and ambiguous term, often used as a sustainability claim and rarely understood by consumers (Galarraga Gallastegui, 2002). However, also terms that are quite well regulated by law, such as the term "organic" (Pekdemir, 2018), can still be misunderstood (Ge & Brewster, 2016; Parker et al., 2021). If consumers experience that a sustainability label is unclear, they may try to find more credible information about the label, but there is a high risk that they will enter a mode of inaction (Mitchell et al., 2005). We argue here that informed consumers are likely to perceive a visually communicated meta sustainability labeling scheme as less ambiguous and, therefore, less confusing, compared to multiple single-issue sustainability labels. Hence, informed consumers are reassured that a product with the meta sustainability label and/or with a qualified label recognizable by the family label design has been assessed on its overall sustainability performance. Specifically, a meta sustainability label can act as a salient family label, allowing the consumer to make fewer label comparisons with less ambiguous or unclear stimuli, compared to a situation where multiple sustainability aspects are labeled with traditional, stand-alone single-issue labels. Consequently, consumers will likely perceive a meta sustainability label as a clearer and less ambiguous signal about the product's overall sustainability performance, reducing doubts and questions regarding waterbed effects and greenwashing attempts.

Meta Sustainability Labeling reducing overload confusion. The increasing number of sustainability labels is often mentioned as a source of consumer confusion (Grunert et al., 2014; Harbaugh & Maxwell, 2011). Even when label competition is viewed as a means to achieve better standards (Gruère, 2015; Li, 2020), positive label competition requires that consumers understand the differences between them and can distinguish them from each other (Karl & Orwat, 1999). Difficulties in comprehending the different labels can add to information overload (Grunert, 2011). For example, using a sample of more than 30 sustainability labels that an average North American consumer could easily face in a shopping situation, Heyes et al. (2020) question the assumption that consumers or even experts know what specific sustainability labels actually mean and how they differ from each other. Other studies also found that the increasing number of

sustainability labels leads to overload confusion (Langer & Eisend, 2007) and that consumer confusion is bigger in industries where the number of sustainability labels is higher (Moon et al., 2017).

When there are too many stimuli, including sustainability labels, in the surroundings, consumers try to simplify (Sunstein, 2013). A meta sustainability label scheme that delivers meta information in the form of a family brand of qualified sustainability labels might be helpful in this respect. Instead of needing to pay attention to a plethora of different sustainability labels and making sense of their meaning and differences, a meta sustainability label or an interconnecting, family label design can potentially reduce the choice options to two: being part of the meta labeling scheme or not. Hence, if a meta sustainability labeling scheme is correctly perceived as an overarching framework, we assume that a family labeling design allows the consumer to make fewer label assessments and less information overload, leading to more consumer clarity about the overall sustainable performance of a product.

Meta Sustainability Labeling reducing similarity confusion. Not only is there an increasing number of sustainability labels, but many of them look similar, especially when designed by firms as so-called private copy-cat labels (Moon et al., 2017). A physical similarity may further increase consumer confusion because it becomes more challenging to distinguish sustainability labels from each other (Y.-S. Chen & Chang, 2013). However, sustainability labels can also look different but refer to the same or similar sustainability issues on the same or different products, such as the Nordic Swan and EU's Flower. The experienced uncertainty adds to the confusion regarding what specific sustainability performance criteria are met by the label.

Also, the same sustainability label on (or not on) products can cause uncertainty, specifically in the case of voluntary labels. Harbaugh and Maxwell (2011) argue that consumers can face uncertainty about a product's quality because they do not know how to assess a sustainability label's presence or absence. They further state that some firms use consumers' uncertainty about labels strategically, for example, by labeling their "bad" products to benefit from spillover effects from "good" products being labeled with the same sustainability label. Again, this may exacerbate consumer uncertainty and confusion about the label.

Intended or not, when unconnected sustainability labels are similar, this can make the consumer not only confused but also ashamed of their inability to assess differences between sustainability labels (Mitchell et al., 2005). This negative emotion might provoke the choice of a non-labeled product to avoid difficult trade-offs (Dhar, 1997). A meta sustainability label can achieve perceived uniqueness among the stand-alone single-issue labels (Fitzgerald et al., 2019).

APPENDIX 2

The discrete choice experiment

Discrete choice experiments (DCE) are used widely in marketing and consumer research to estimate the value of product attributes to consumers and predict how consumers will react to changes in price, formulation, or design of different attributes (Hempel & Hamm, 2016; Orme, 2010; Schjøll, 2017; Thøgersen et al., 2019; Xie et al., 2016). Especially a DCE is often used to predict demand for new products or product attributes that do not yet exist in the market. Because we cannot observe individual behavior in real markets – our new label designs do not yet exist – we instead investigate the stated preferences of consumers (Bliemer & Rose, 2014; Jacobs & Hörisch, 2022). This also has the benefit of being able to control for other influences in the choice situation. In a DCE, participants make repeated choices between products with different levels on selected product attributes assembled in choice sets. A DCE allows to "disentangle" participants' revealed product preferences into preferences for levels of the different product attributes (Green & Srinivasan, 1990). Instead of simply declaring their preference or willingness to pay for a product or specific product attributes, participants react to a hypothetical purchase scenario and their choices reveal their preferences (Allenby et al., 2019; Bliemer & Rose, 2014). Participants are arguably less affected by social desirability and other biases when making these choices in a hypothetical purchase scenario rather than simply being asked about their preferences (Auger & Devinney, 2007).

To make sure participants were able to make meaningful choices, we screened them for relevant experience. We chose coffee as the product category because it is consumed by most consumers in the two countries and is considered a pioneer product for sustainability labeling schemes and often labeled with more than one sustainability label, especially the organic and the Fairtrade label (Birkenberg et al., 2021; Maaya et al., 2018; Reinecke et al., 2012; Thøgersen & Nielsen, 2016; Van Loo et al., 2015).

Following general survey design principles (Diamond, 2000), a lot of effort was put into formulating questions in a way that was unambiguous and easy to understand. The questionnaire was pre-tested, and necessary adjustments were made in formulations, layout, and the number of choice sets (eight choice sets with four choice options, incl. "none of these"). Before the hypothetical purchase scenarios, participants were asked to imagine a regular shopping situation. To increase realism, four attributes were varied – labeling, country of origin, roasting, and price – which we judge is sufficient to represent a realistic product choice for a fast-moving consumer good, such as coffee. To account for the remaining important product attributes that were not included, a no-choice option was provided in each choice-set (Janssen & Hamm, 2012).

Furthermore, we asked respondents to imagine that all alternatives were their favorite or usual brand (Allenby et al., 2019). Obviously, the more familiar participants are with the product, the more likely they have well-developed preferences that can be activated, and the less likely they will engage in constructing preferences in the situation (Allenby et al., 2019). This is another reason for screening participants for past product purchases or experiences.

APPENDIX 3

Sample characteristics by country

	USA	Germany
N	518	520
Gender, % (female/male)	51.7/48.3	50.4/49.6
Age, %	18–88 y/o	18–81 y/o
18–34	30.9	25.0
35–49	29.5	26.7
50–64	20.1	35.8
65-more	19.5	12.5
Education, %[a]		
Less than high school	1.9	44.0[6] We checked statistics on German education to see if the German sample is biased towards a lower educated German population. However, the statistical data cannot be compared directly because school and work education are listed separately. Nevertheless, the measures on the higher education, such as Master and Promotion are almost like our sample. We therefore assume that the difference between USA and Germany on this point is primarily a matter of different classifications of the different education systems. Sources for statistical data were German Federal Statistical Office, https://www.destatis.de/DE/Themen/Gesellschaft-Umwelt/Bildung-Forschung-Kultur/Bildungsstand/Tabellen/bildungsabschluss.html;jsessionid=4205962CEDE4DA6799144D2A02C16AAB.internet8732 and Statista, https://de.statista.com/statistik/daten/studie/1988/umfrage/bildungsabschluesse-in-deutschland/.
High school	18.1	26.7
Further education up to bachelor's degree	56.8	11.0
Master's degree or higher	23.2	18.2
Household size, mean	3.06	2.27
Children (<18y/o) in household, mean	1.88	1.42
Household income, %[b]		
Level 1	12.5	2.9
Level 2	17.4	3.5
Level 3	15.1	12.5
Level 4	11.6	12.3
Level 5	7.7	14.6
Level 6	9.7	14.4
Level 7	3.3	11.0
Level 8	5.6	6.3
Level 9	3.3	2.7
Level 10	3.9	3.1
Level 11	1.5	4.0
Level 12	4.9	6.2
Do not wish to say	3.3	5.0
Do not know	.4	1.5

[a] USA: What is your level of education? (1) Less than high school, (2) High school graduate, (3) Some college, (4) 2 year degree, (5) 4 year degree, (6) Professional degree, (7) Doctorate.
German: Welches ist Ihr höchster Bildungsabschluss? (1) Hauptschulabschluss oder qualifizierender Hauptschulabschluss, (2) Mittlerer Schulabschluss/Realschule, (3) Fachhochschulreife/Fachabitur, (4) Abitur, (5) Bachelor/Vordiplom, (6) Master, Diplom, Magister, (7) Promotion.

[b] USA (yearly): (1) Less than $20.000, (2) $20.000–39.999, (3) $40.000–59.999, (4) $60.000–79.999, (5) $80.000–99.999, (6) $100.000–119.999, (7) $120.000–139.999, (8) $140.000–139.999, (9) $160.000–179.999, (10) $180.000–199.999, (11) $200.000–219.999, (12) $220.000 or more.
Germany (yearly): (1) Less than EUR 5.000, (2) EUR 5.000–9.999, (3) EUR 10.000–19.999, (4) EUR 20.000–29.999, (5) EUR 30.000–39.999, (6) EUR 40.000–49.999, (7) EUR 50.000–59.999, (8) EUR 60.000–69.999, (9) EUR 70.000–79.999, (10) EUR 80.000–89.999, (11) EUR 90.000–99.999, (12) EUR 100.000 or more.

APPENDIX 4

Introduction of the labels before the choice experiment

Please carefully look at the visual of the Sustainable Development Goals, developed and introduced by the United Nations (UN) and indicate your opinion below.

This sustainability label can only be used on products that have been certified by an authorized control agency. Please indicate your opinion regarding the label below.

This sustainability label can only be used on products that have been certified by an authorized control agency. Please indicate your opinion regarding the label below.

This sustainability label can only be used on products that have been certified by an authorized control agency. Please indicate your opinion regarding the label below.

This sustainability label can only be used on products that have been certified by an authorized control agency. Please indicate your opinion regarding the label below.

This recently designed holistic sustainability label certifies an overall positive performance of the product on all sustainability dimensions. Sustainability labels certified by this holistic sustainability framework can be identified by this label, the rainbow circle. It can only be used on products that have been certified by an authorized control agency. Please indicate your opinion regarding the label below.

APPENDIX 5

Mean values and standard deviations (in parentheses) of potential moderators for each country

Items, mean (SD)	USA	Germany	*t*	*p*
n	*518*	*512*		
Attitude towards sustainability labeling				
(1) meaningless – meaningful	5.28 (1.82)	5.32 (1.86)	.42	.674
(2) useless – useful	5.35 (1.85)	5.26 (1.82)	.83	.405
(3) insignificant – vluable	5.21 (1.84)	5.15 (1.92)	.48	.632
Usefulness of sustainability labeling				
(1) The sustainability labels enable me to accomplish shopping tasks more quickly.	4.88 (1.79)	4.60 (1.75)	2.59	.010
(2) The sustainability labels enhance my effectiveness in my shopping tasks.	4.92 (1.77)	4.56 (1.79)	3.25	.001
(3) The sustainability labels make it easier to do my shopping tasks.	4.86 (1.81)	4.71 (1.87)	1.34	.179
Subjective knowledge on sustainability labeling				
(1) I know quite a lot about sustainability labeling.	3.90 (2.02)	3.45 (1.59)	3.96	<.001
(2) I am one of the experts on sustainability labeling among my acquaintances.	3.55 (2.11)	2.92 (1.66)	5.32	<.001
(3) I feel well-informed about sustainability labeling.	4.14 (1.98)	3.67 (1.64)	4.16	<.001
Ambiguity confusion towards sustainability labeled food products in shopping situations				
(1) Food products often have so many features that a comparison of different sustainability labels is barely possible.	4.66 (1.62)	4.63 (1.60)	.25	.799
(2) The information I get from sustainability labels often are so vague that it is hard to know how a product actually performs.	4.37 (1.74)	4.79 (1.56)	−4.10	<.001
(3) When buying a food product I rarely feel sufficiently informed about its sustainability features.	4.59 (1.66)	4.77 (1.49)	−1.78	.076
(4) When buying certain food products, I feel uncertain about which sustainability features are particularly important for me.	4.47 (1.68)	4.63 (1.48)	−1.64	.102
(5) When buying certain food products, I need further help to understand differences between sustainability labels.	4.57 (1.77)	4.57 (1.61)	.01	.991
Overload confusion towards sustainability labeled food products in shopping situations				
1) I do not always know exactly which sustainability labels to rely on when choosing products.	4.47 (1.76)	4.79 (1.59)	−3.03	.003
(2) there are so many sustainability labels to choose from that I sometimes feel confused.	4.55 (1.75)	4.89 (1.64)	−3.17	.002
(3) owing to the many sustainability labels, it is sometimes difficult to decide which one to focus on.	4.53 (1.66)	5.01 (1.59)	−4.70	<.001
(4) many sustainability labels are very similar and are therefore hard to distinguish.	4.46 (1.64)	4.72 (1.57)	−2.57	.010
Similarity confusion towards sustainability labeled food products in shopping situations				
(1) Owing to the similarity of many sustainability labels it is often difficult to detect new sustainability labels.	4.54 (1.70)	4.78 (1.57)	−2.30	.021
(2) Some sustainability labels look so similar that it makes me uncertain whether they are verified by the same organization or not.	4.61 (1.68)	4.84 (1.57)	−2.25	.025
(3) Sometimes I want to buy a food product labeled with a sustainability label seen in an advertisement, but cannot identify it clearly between the many similar labels.	4.30 (1.66)	4.18 (1.72)	1.11	.266

Note: Measures were all on a 7-point scale from (1) 1 = Definitely never seen to 7 = Have seen it many times, (2) 1 = Very unfamiliar to 7 = Very familiar, (3) 1 = Dislike it a great deal to 7 = Like it a great deal.

APPENDIX 6

Examples of choice sets

USA, condition 1 (traditional).

Germany, condition 3 (traditional + meta).

USA, condition 4 (new design + meta).

APPENDIX 7

Familiarity and visual appearance of the Fairtrade label for traditional and new design, mean values, and standard deviations (in parentheses)

	USA				Germany			
Items, mean (SD)	Traditional labeling	New design	t	p	Traditional labeling	New design	t	p
n	*257*	*261*			*256*	*256*		
Familiarity								
Have you seen this label before? - *Fairtrade*	3.33 (2.19)	2.90 (2.22)	−2.20	.028	5.87 (1.74)	2.75 (2.22)	−17.67	< .001
How familiar are you with this label? - *Fairtrade*	3.29 (2.13)	2.94 (2.28)	−1.82	.069	5.70 (1.76)	2.83 (2.24)	−16.10	< .001
Visual appearance								
Do you like the visual appearance of this label? - *Fairtrade*	4.79 (1.61)	5.00 (1.82)	−1.36	.173	5.59 (1.51)	4.72 (1.85)	−5.81	< .001

Note: Measures on familiarity and visual appearance were all on a 7-point scale from (1) 1 = Definitely never seen to 7 = Have seen it many times, (2) 1 = Very unfamiliar to 7 = Very familiar, (3) 1 = Dislike it a great deal to 7 = Like it a great deal.