Consumer Perceptions of Product Sustainability: The Role of Country-Specific Influences

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Abstract

A conceptual model is developed and tested showing how different country-specific constructs – varying in their level of abstraction and conceptual proximity to the sustainability domain – influence consumer perceptions of product sustainability, beyond the effects of explicit sustainability cues, namely eco-labels. The results show that ecological/environmental country image is not the sole driver of sustainability perceptions, the latter being further affected by the product-country image, consumers' stereotypical judgments of country warmth and competence, and product typicality. Implications of the findings are considered and future research directions identified.

Introduction and Objectives

Consider the following scenario:

Alberto wants to buy a new washing machine. He walks into a major electrical goods retailer and looks at various brands, noting their performance, price, warranty, etc. If, like most consumers nowadays, Alberto also values sustainability as a product attribute, what information is he going to use to compare the various washing machine brands/models in terms of their ecological/environmental "footprint"?

Conventional wisdom – based on extant literature – suggests that Alberto will primarily rely on *eco-labels* to make his evaluation of product sustainability. These labels (e.g., Fairtrade, EU Ecolabel, Rainforest Alliance) communicate third-party verified environmental or social attributes of a product and serve as proxies for trust and responsibility in the eyes of the consumer (Szöcs and Montanari, 2025). Consistent with the triple bottom-line notion of sustainability (Elkington, 1997), eco-labels labels may convey information about environmental sustainability (e.g., carbon footprint), social sustainability (e.g., absence of animal testing), or economic sustainability (e.g., fair prices for producers) and "are important cues for consumers in their evaluations of a product with respect to environmental and social regulations" (Dekhili, Crouch, and El Moussawel, 2021, p. 666). Given that most consumers have neither sufficient expertise nor the inclination to engage in detailed assessments of the production processes involved in the creation of products, they tend to rely on extrinsic cues (such as eco-labels) to assess sustainability claims and make purchase decisions (Singh et al., 2023). Importantly, eco-labels are perceived by consumers as more objective and credible than firm-generated environmental claims (e.g., "100%

recyclable"), corporate social responsibility (CSR) statements, or cause-related marketing messages (Darnall, Ji, and Vazquez-Brust, 2018).

While highly diagnostic, eco-labels are not the only cue that will affect Alberto's perceptions of product sustainability. This is because such perceptions are not formulated based solely on the presence of an *explicit* sustainability cue (such as an eco-label) but also *implicitly* influenced by consumer evaluations of the product's country-of-origin (COO). Specifically, the *absence* of a sustainability label does not automatically mean that Alberto will conclude that the product is not sustainable. In line with research on COO signaling (e.g., Magnusson, Westjohn, and Zdravkovic 2011; Cowan and Guzman 2020), COO is a visible signal that *even on its own* can influence consumer evaluations of sustainability: consumers may assume that the product is sustainable because it originates in a country with a strong image (Dekhili, Crouch and El Moussawei, 2021). Conversely, the *presence* of an explicit sustainability cue (e.g., an eco-label) does not guarantee that the product will be perceived as being sustainable: if the product's COO is not highly regarded, the sustainability information conveyed to consumers by the eco-label may not be seen as being a sufficiently credible or reliable signal (Scrimieri et al., 2024).

While there is abundant evidence that a product's COO impacts consumer evaluations of a product's sustainability (Magnusson, Westjohn and Zdravkovic, 2015; Rashid and Byun, 2018; Xiao and Myers, 2022), extant research offers little insight on exactly *how* (and *which*) consumer assessments of the product's origin trigger perceptions of sustainability. Some authors maintain that environmental and social aspects are integral dimensions of the country image (Lala, Allred, and Chakraborty, 2008), others lament that conventional/traditional country image measures (reviewed in Roth and Diamantopoulos, 2009) "completely exclude environmentally and socially related dimensions" (Dekhili and Achabou 2015, p.91), and still others consider the ecological/environmental/"green" image of a country as a construct in its own right and distinct from conventional country image notions (e.g., Thøgersen and Pedersen, 2021).

Against this background, the present paper seeks to explore the exact nature of the link between a product's COO and consumer perceptions of product sustainability by integrating various country-specific constructs within an overall conceptual model, which is subsequently tested in a study with Italian consumers (N = 612).

Conceptual Model

We draw on the literature on country stereotyping (e.g., Chattalas, Kramer and Takada, 2008; Diamantopoulos et al., 2017; Magnusson, Westjohn and Sirianni, 2019), country image (e.g., Brijs, Bloemer and Kasper, 2011; Diamantopoulos, Schlegelmilch and Palihawadana, 2011; Josiassen et al., 2013), and the link between COO and sustainable consumer behavior (e.g., Dekhili and Achabou, 2015; Götze and Brunner, 2019; Tran and Paparoidamis, 2020) to identify country-level constructs at different levels of abstraction and their associated pathways leading to product sustainability perceptions (Figure 1).

INSERT FIGURE 1 HERE

Consistent with prior research (Maher and Carter, 2011; Motsi and Park, 2020), we specify *country warmth* and *country competence stereotypes* – namely shared beliefs about traits that are characteristic of people living in a country (Maheswaran, 1994; Chen et al., 2014; Halkias et al., 2016) – as cognitive antecedents of (a) the *product-country image* (PCI), namely "the overall perception consumers form of products from a particular country based on their prior perceptions of the country's production and marketing strengths and weaknesses" (Roth and Romeo 1992, p.480), and (b) the (domain-specific)

environmental/social country image (ECSI) which focuses specifically on "consumers' perceptions of a country's sustainable development reputation" (Tran and Paparoidamis, 2020, p.76). We also include *product typicality* – the degree to which a product is perceived to represent an origin (Tseng and Balabanis 2011; Spielmann, 2016)[1] – as a further predictor of PCI and ESCI. In turn, PCI and ESCI are modeled as predictors of product sustainability perceptions, the latter being also directly influenced by the presence/absence of an eco-label.

The conceptual logic underlying the pathways of the model in Figure 1 is consistent with both the classification and the irradiation perspectives as applied in COO research (e.g., Balabanis and Diamantopoulos, 2008; Diamantopoulos, Schlegelmilch, and Palihawadana, 2011). The former perspective highlights the transfer of knowledge regarding a COO to infer a product's unknown attributes, whereas irradiation focuses on subjective interconnections of consumer evaluations of related objects/properties. According to both perspectives, COO serves as a signal to consumers to draw inferences about unobservable attributes (such as sustainability).

Empirical Study

Following a pretest (N=61), a total of 612 consumers (all Italian citizens; M_{age} = 33.6, SD_{age} = 11.0; 48.4% female, 1.3% non-binary, 0.3% did not disclose) were recruited on the *Prolific* platform (www.prolific.com) and completed an online questionnaire created using *Qualtrics* software, following back-translation procedures (Behling and Law, 2000). A between-subjects design was adopted whereby participants were randomly assigned to one of four conditions in which they were exposed to a fictitious microwave brand (CDMA), originating either in Türkiye or Germany, and with/without an Energy Star label. The latter is frequently displayed on appliances and certifies products that meet stringent energy efficiency standards. Consumers are not only highly familiar with the Energy Star label but also trust it as a reliable indicator of energy-efficient product performance (Murray and Mills, 2011). Note that the use of two different stimuli COOs was solely intended to maximize variance in country perceptions rather than generate a contrast for cross-country comparisons. This practice of incorporating multiple stimuli (here, more than one COO) to increase variance in predictor variables is widely used in international marketing literature (e.g., Davvetas and Diamantopoulos, 2016).[2] Note that, for purposes of estimating/testing our model in Figure 1, the choice of *specific* countries is *not* important: what *is* important is generating *sufficient variance* in the predictor constructs. Assuming that this is ensured, *any* set of countries (or even a single country) active in the relevant product category could have been used and the model structure would have remained unchanged.

Microwaves were chosen as the focal product category because of their widespread presence in Italian households and because they involve deliberate purchase decisions, requiring consumers to evaluate product attributes such as performance, longevity, and energy efficiency. Energy efficiency is a prominent feature in microwave marketing (e.g., Singhal et al. 2019) thus providing a suitable context for investigating sustainability perceptions.

Participants completed established scales drawn from the literature capturing country warmth and country competence stereotypes (Halkias and Diamantopoulos, 2020), product typicality (Halkias and Diamantopoulos, 2020), PCI (Roth and Romeo, 1992), ESCI (Lala,

[1] In the COO literature, product typicality is also referred to as product-country match (Roth and Romeo1992) or product ethnicity (Usunier and Cestre 2007).

[2] For example, the variance in the PCI of Germany was 0.84 and of Türkiye 1.32 (on a seven-point scale); however, the variance of the combined countries came to 1.99, which is higher than the individual country variances.

Allred, and Chakraborty, 2008), perceived product sustainability (Gershoff and Frels, 2015) as well as consumer demographics (gender, age, income).

Findings

Using LISREL 12 (Jöreskog and Sörbom, 2022), we first conducted a confirmatory factor analysis of the construct measures comprising the model in Figure 1. Overall model fit was satisfactory (χ^2 = 840.34, DF = 255; RMSEA = 0.061, NNFI = 0.959, CFI = 0.965; SRMR = 0.055) with construct reliabilities (CR) and average variance extracted (AVE) well exceeding the 0.60 and 0.50 recommended thresholds (Bagozzi and Yi, 1988, 2012); moreover, all AVEs exceeded the squared inter-construct correlations, thus demonstrating discriminant validity (Fornell and Larcker, 1981). We next estimated a structural equation model corresponding to Figure 1 and obtained acceptable fit (χ^2 = 917.24, DF = 260; RMSEA = 0.064, NNFI = 0.955, CFI = 0.961; SRMR = 0.078).[3] Figure 2 shows the relevant (standardized) parameter estimates as well as the variance explained in the endogenous constructs.

INSERT FIGURE 2 HERE

Consistent with the model conceptualization, both stereotypical dimensions (country warmth and country competence) as well as product typicality significantly impact PCI and ESCI, explaining substantial amounts of variance (almost 70% for both constructs, corresponding to large effect sizes – see Cohen, 1988). Surprisingly, country warmth has a *negative* effect on PCI and ESCI, thereby counteracting the positive effects of country competence and product typicality. Even more surprising is that only PCI and the presence of an eco-label drive consumer perceptions of product sustainability and explain 15% of the variance in the latter (a medium effect size); the ESCI has no significant effect, although it is precisely this construct that – based on extant literature – would be expected to have the strongest influence on sustainability perceptions (e.g., Dekhili and Achabou, 2015; Achabou, Dekhili and Hamdoun, 2023; Tran and Paparoidamis, 2020).

This unexpected finding inevitably raised the question of whether the relationship between ESCI and sustainability perceptions might be suppressed due to a third (omitted) variable and led us to revise the original model. Specifically, we estimated an alternative model by also including *direct* paths from country warmth and competence to sustainability perceptions, while keeping all other paths the same (Figure 3).[4] This revised model produced good overall fit (χ^2 = 869.44, DF = 258; RMSEA = 0.062, NNFI = 0.958, CFI = 0.964; SRMR = 0.062) and significantly better than that of the original model ($\Delta\chi^2$ = 47.80, DF = 2; $p <$ 0.001).

INSERT FIGURE 3 HERE

As can be seen from Figure 3, our suspicion of suppression was vindicated since a positive significant link between ECSI and sustainability perceptions emerged, once country warmth and country competence were included as predictors of the latter.[5] These country

[3] As PCI and ESCI are likely to have common unmodeled antecedents, their disturbance terms were allowed to correlate during model estimation.

[4] This model revision also enabled us to test whether PCI and ESCI fully mediate the effects of the country stereotypes on consumer perceptions of product sustainability as implied by Figure 1.

[5] Further analysis revealed that the suppressor variable was country competence rather than country warmth.

stereotype dimensions had respectively positive (warmth) and negative (competence) direct effects on sustainability perceptions and their inclusion substantially increased the explained variance in the latter (from 15% to almost 23%). Notably, for both stereotype dimensions, competitive mediation (Zhao, Lynch and Chen, 2010) was observed, albeit of a different nature: for country warmth, the indirect effect was negative, and the direct effect was positive; for country competence, the opposite was the case.

In terms of total effects (all of which were positive and significant), a comparison of the associated (standardized) estimates revealed that PCI (0.361) has the highest overall influence on sustainability perceptions, followed by ESCI (0.239), eco-label (0.231), product typicality (0.139), country warmth (0.190), and country competence (0.120).[6]

Discussion and Conclusions

To the best of our knowledge, this is the first effort seeking to determine how different country-specific constructs – varying in their level of abstraction and conceptual proximity to the sustainability domain – influence consumer perceptions of product sustainability beyond the effects of explicit sustainability cues, namely eco-labels. Although, intuitively, one would expect that only aspects specifically related to the ecological/environmental/social reputation of a country (here captured by the ESCI) would be the drivers of product sustainability perceptions, our results show that that the latter are also substantially influenced by (a) perceptions of product innovativeness, design, prestige, and workmanship (as captured by the PCI), (b) stereotypical judgments of a country and its people, and (c) product typicality. Thus, solely relying on the ecological/ecological/green reputation of a country as previous research has often done (e.g., Cowan and Guzman, 2020; Dekhili and Achabou, 2015; Tran and Paparoidamis, 2020) is *not* sufficient for explaining the formation of product sustainability perceptions by consumers.

Two explanations can be offered for the observed pattern of findings. First, PCI acts as a powerful heuristic shortcut through which consumers' broader associations with innovation, design, workmanship, and prestige extend to all product attributes, including sustainability. For example, when a country's products are viewed as highly innovative and technically advanced, consumers may naturally infer that its products incorporate eco-efficient technologies or optimized production processes, making them more sustainable. Likewise, a reputation for superior craftsmanship signals durability and build quality – traits that buyers may also instinctively link to sustainability. Second, genuine sustainability assessments require not only ecological credentials (i.e., a strong ESCI) but also confidence in technical competence (Chernev et al., 2024): a nation known solely for its environmental stance but lacking a reputation for manufacturing excellence (i.e., a strong PCI) may provoke skepticism about the true quality/durability of its products.

A particularly intriguing finding is that country warmth – capturing stereotypical judgments of friendliness, kindness, and likeability – was found to have negative effects on both PCI and ESCI but a positive effect on product sustainability perceptions. In contrast, country competence – capturing stereotypical judgments of ability, efficiency, and skillfulness – was found to have positive effects on PCI as well as ESCI but a negative effect on product sustainability perceptions. These opposing patterns suggest that warmth and competence can

[6] Note that total effects – as calculated in LISREL – should be interpreted with caution as they include indirect effects assessed via the Sobel test which has long been criticized in the literature, with bootstrapping offering a superior alternative (Preacher and Hayes, 2004, 2008).

produce effects at odds with one another and that any assumption that the two stereotypical dimensions will be mutually reinforcing in affecting outcome variables is not warranted.

For managers wishing to highlight the sustainability of their products, the main message is that they should not only highlight the ecological image of their product's COO in their marketing communications but also its PCI – in addition to, of course, using an eco-label as an explicit sustainability cue. Managers should also be aware that consumer perceptions of product sustainability will be enhanced when the focal product is viewed as being typical of its origin (e.g., fashion and Italy). Product typicality boosts consumer evaluations of both PCI and ESCI and, through them, improves product sustainability perceptions. Although product typicality is not widely used as a variable in sustainability research, it seems to be a promising construct worthy of attention in this context.

Regarding future research, replications of the current study in other product categories, with other COOs as stimuli, and different kinds of eco-labels are clearly needed to test the stability and generalizability of the findings. Similarly, the latter's cross-national stability (or otherwise) needs to be established by carrying out the study in countries other than Italy. Moreover, the moderate amount of explained variance in sustainability perceptions (23%) suggests that there is considerable scope for identifying additional antecedents of the latter. Particularly promising in this respect may be consumer-specific characteristics such as product knowledge and involvement (Lin and Chen, 2006), social/environmental sensitivity (Vieira Araújo and Groening, 2025), or consumer trust and skepticism towards eco-labels (Cho, Ye and Kim, 2024).

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Figure 1: Conceptual Model

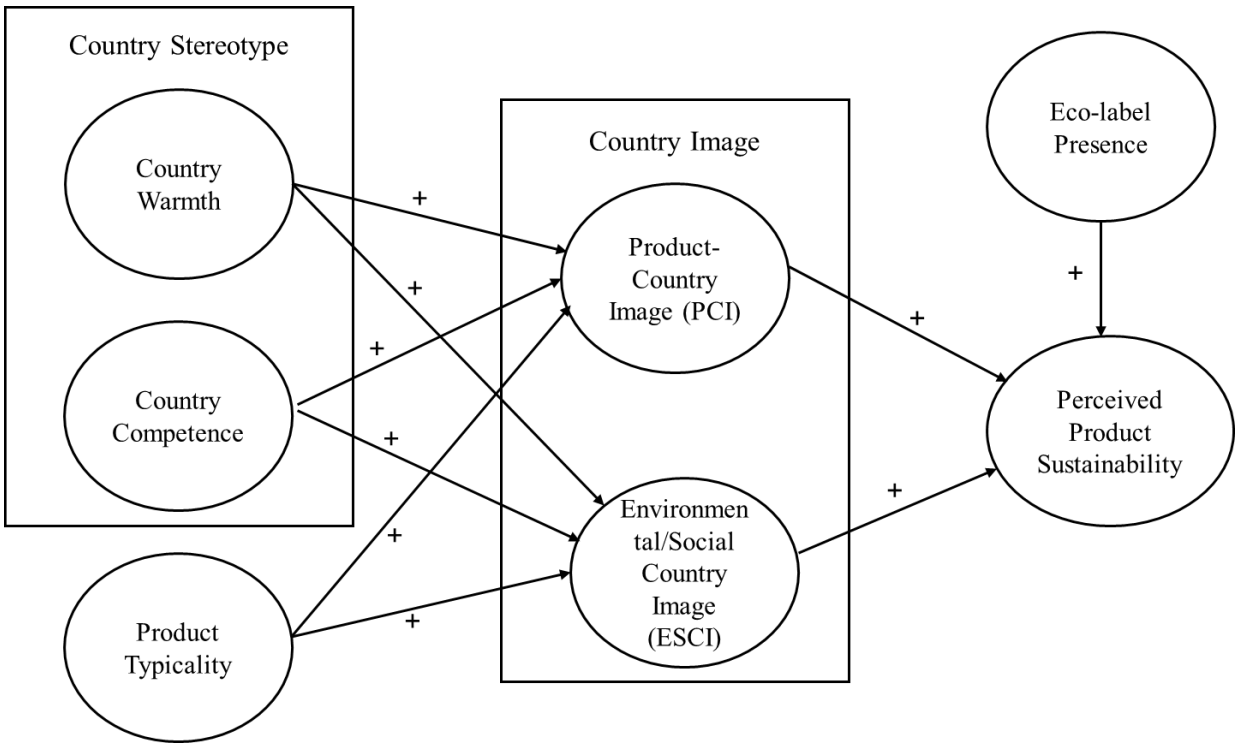
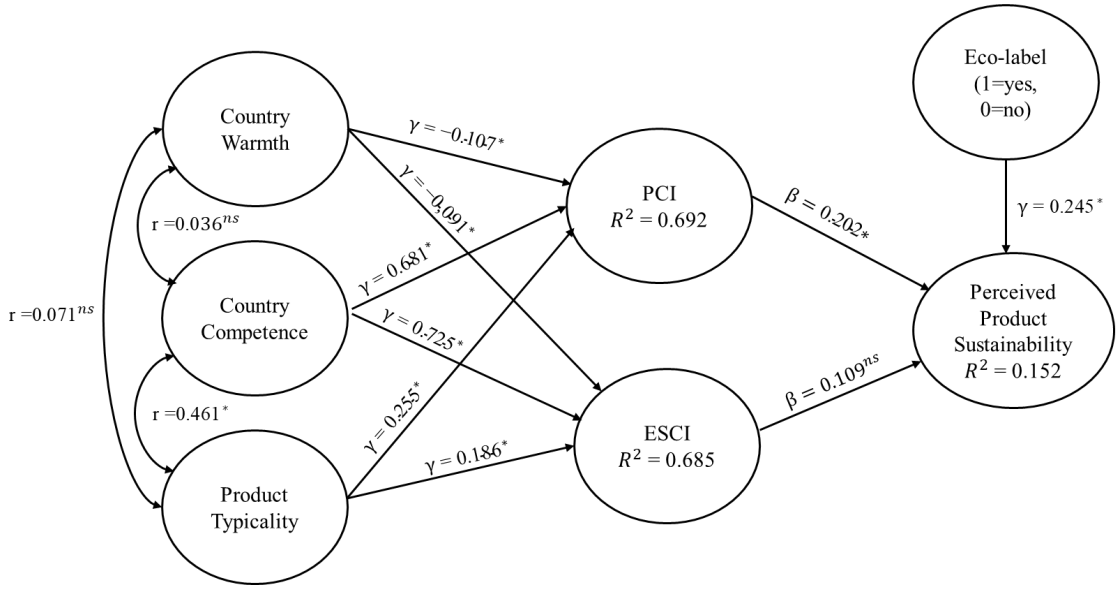


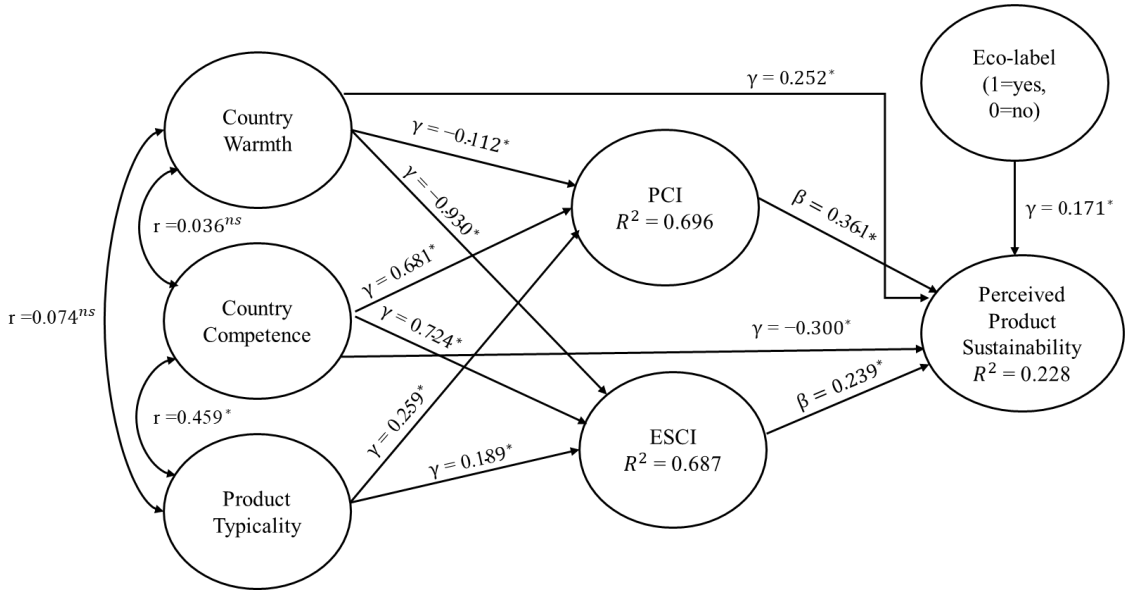
Figure 2: Parameter Estimates – Original Model



Notes: * $p < 0.01$ or better; ns not significant; although not shown, correlations of eco-label with other exogenous

constructs are all not significant.

Figure 3: Parameter Estimates – Revised Model



Notes: * $p < 0.01$ or better; ns not significant; although not shown, correlations of eco-label with other exogenous constructs are all not significant.