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A cross-cultural study: How product attributes and cultural values influence chocolate preferences

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ABSTRACT

The prevalence of global environmental issues and dietary-related health problems raises the importance of sustainable food consumption. This study investigates the relationship between consumers' personal and cultural values and their chocolate preferences across six countries: Vietnam, Iran, Germany, Greece, Turkey, and Venezuela. A choice experiment was conducted with 412 participants, who selected between 100g chocolate bars with varying attributes, including price, type, country of production, label, flavor, and packaging. The results indicate significant cultural differences in the relative importance of these attributes. For instance, Greek participants placed the highest importance on chocolate type, while Vietnamese participants prioritized packaging. Iranian consumers were more price-sensitive compared to Venezuelan consumers, who valued flavor more highly.

Sustainable product characteristics were defined by packaging material (plastic, paper, metal, wood, no packaging) and sustainability-related labels (vegan, no palm oil, no sugar added, organic, climate friendly). These were rated positively across most countries, with "climate friendly" labels and non-plastic packaging being particularly favored. The study also found that local production was generally preferred, reflecting a sense of patriotism and support for the domestic economy.

Psychographic constructs, including Hofstede's cultural dimensions (power distance, uncertainty avoidance, collectivism, long-term orientation, and masculinity), as well as personal health responsibility, environmental consciousness, conspicuousness and prestige value, quality aspects, and patriotism, were used to profile the participants. These constructs provided deeper insights into the cultural values influencing chocolate preferences.

These findings highlight the need for culturally tailored marketing strategies to promote sustainable food choices.

1. Introduction

Understanding factors influencing consumer behavior regarding food is important because it impacts the planet's environment and human health and well-being more than other goods [1]. The environmental impacts of food are visible in every stage of its life cycle. For most products, the agricultural phase has the highest impacts, depending on the type of food, varying across different indicators [2]. Due to high energy consumption and the related emissions, food processing and logistics are also recognized as major sources of environmental impacts [3]. In addition, plastics that are widely used in the food packaging industry are a growing concern due to their consequences when released into the environment [4]. Globalization and industrialization of food markets enhance the availability of food, as well as contribute to economic growth; however, they also give rise to many unhealthy eating practices [5]. Ultra-processed foods, which are typically low-cost, energy-dense, high in unhealthy types of fat, refined starches, free sugars and salt, and poor sources of protein, dietary fiber and micronutrients, are criticized for being unhealthy and promoting overconsumption [6]. While hunger and undernutrition are still not fully eliminated, there is a rising prevalence of micronutrient deficiencies, overnutrition and obesity, especially in urban areas [5]. Furthermore, poor diet quality is associated with an increased risk of various non-communicable diseases, such as coronary heart disease, stroke, and diabetes, as well as mental disorders, such as depression and dementia [7].

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According to Poore and Nemecek [8], environmental impact of the same product can vary by up to 50 times across producers. However, consumers may have difficulties accessing relevant information. First, estimating product impact requires taking into account various aspects and attributes simultaneously, including ingredients, production mode, transport, and processing [9–11]. For example, the benefit of local products for using less energy during transportation may be lost if the local production of raw materials has significantly more negative effects [12]. Furthermore, some information may not be made available to the consumers [10]. To reduce information asymmetry between producers and consumers, labels have been added to inform product credence attributes, such as organic and carbon neutral production methods [13].

However, there are a wide range of motives that driven consumer choice [14]. At the same time, each food product is a combination of various attributes, offering a different set of values [13]. Considering food choice a goal-directed behavior, Vermeir et al. [15] highlighted that there are situations where a product satisfies sustainability goal but no other goals. Trade-offs between favorable attributes are therefore unavoidable. For example, compared to conventional products, organic products provide sustainability benefits regarding health, environment, and animal welfare but their higher costs may discourage consumers from purchasing them [16].

People make multiple food-related decisions every day, but the larger part of these decisions is unaware [17]. When making a mindful food choice, consumers engage in a cognitive process of consideration and negotiation of food choice values and their personal evaluation [18]. In recurring situations, consumers rely more on classifications of foods and situations, food choice strategies, scripts, and routines to reduce cognitive effort required for decision making [18]. Thus, it is understandable that food choice motives, food attributes, categories and perception have significant impacts on food choice decision-making process [19]. The relative importance of eating motives was found to vary among consumers with different socio-demographic characteristics (such as gender, age, and body mass index (BMI)) [20], and psychological characteristics (such as lifestyle and self-identity) [21]. Petrescu, Vermeir and Petrescu-Mag [22] found that to evaluate food healthiness, consumers pay more attention to ingredients, nutrition facts, and additives, while they are more likely to use packaging, food origin, and production type to evaluate food environmental impact. According to Mhurchu et al. [23], these motives may further vary between food categories. For example, consumers are more likely to use labels for foods groups with heterogeneous nutrition composition, contrary to food groups with homogeneous nutrition composition and products which consumers already classify as either ‘unhealthy’ or ‘healthy’ [23]. Furthermore, product attributes have effects on one another. In non-conflicting (vs. conflicting) choice context, food attributes such as health, taste and price complement each other and improve perceived values of the products [24]. Additionally, a feature can become less influential when there are more important product attributes available [25]. Nevertheless, it is noteworthy that an attribute may possess multiple values and consumers might have different food motives simultaneously. For example, sustainable food choices are supported not only by their environment benefits but also by being the objects of impression management [26].

Within a certain situation, food choice consideration process is influenced by a wide range of factors. Chen and Antonelli [27] classified the key factors influencing food choice into three main categories: food-related features, individual differences, and society-related features. Food-related features include the characteristics of the food itself and the related external information and environment. Individuals are characterized by personal-state (including biological features, physiological needs, psychological components and personal habits and experiences) and cognitive traits (knowledge and skills, evaluation-based factors anticipated consequences, personal identity and personal beliefs and values). Macro-environmental factors encompass culture, economic variables, and political elements, which indirectly influence individual food choice, food-related and individual factors [27]. For example, income, food costs, agriculture, and food policies can have an impact on food choices by affecting food availability and affordability [27].

Several attempts have been made to identify factors that influence sustainable diets. Marty et al. [19] showed that motivations are important indicators of diet sustainability. According to their findings, diet sustainability is positively associated with health and sustainability motives, and negatively associated with ease and accessibility motives. Furthermore, Ludwig-Borycz et al. [28] reported a correlation between diet sustainability and personal, behavioral and socio-environmental features, such as higher socio-economic status, greater educational attainment, higher home availability of healthy food and less frequent fast-food consumption. Hoek et al. [29] proposed that it is important to study food consumption in a wider perspective that includes not only personal characteristics and product attributes but also the particular environment, from household and community to political, financial and economic contexts. Additionally, Randall et al. [30] emphasized that food consumption behaviors must be observed in cultural contexts. There is a growing body of literature that recognizes cultural influences on consumer preference and diet sustainability. Results from Djekic et al. [31] identified that motivations behind food choices are influenced by cultural variables. Mertens et al. [32] pointed out that for different European diets, the major difference in green house gas emissions and land use is due to varied distribution of food groups between countries, which is especially related to caloric, total meat, and the percentage of ruminant meat consumption. McBey, Watts and Johnstone [33] demonstated that meat consumption is a practice formed by generations and is deeply ingrained in food culture. Moreover, Ammann, Arbenz, Mack, Nemecek, & Benni [34] highlighted that cooking skills are critical in different diet practices. Thienhirun and Chung [35] found that consumers from different countries also prefer different food product characteristics. Although cultural impacts are important in determining food choice and food sustainability to the best knowledge of the authors, little research investigate the relationship among cultural values and food choice preferences.

Culture is a consistent characteristic of a population and can play a role in formation of individuals’ values [36]. In sociocultural food practices, values orient food choices and food patterns of a population, which exist as food movements, food lifestyles and traditional diets [37]. Halder et al. [38] found that cultural collectivism has a significant positive effect on green consumption values. Furthermore, previous research has established that cultural factors are evidence in shaping diets and food preferences. Consumers from different countries might have varied preferences for basic tastes due to different diet and market availability [39]. In addition, Risso et al. [40] suggested that different genetic variants on chemosensory receptors relate to taste preference differences across populations. Other factors such as individuals’ overall attitude toward foods, familiarity with foods, acceptance and linguistic understanding [41], perception of food-related wellbeing [42], and cultural identity [43] also have significant impacts on diets.

Hofstede’s cultural dimensions theory provides a framework for understanding how cultural differences shape behaviors, values, and organizational practices across societies. Developed by Geert Hofstede [44], this model identifies six key dimensions that characterize cultural values: 1. Power Distance measures the extent to which less powerful members of a society accept and expect unequal power distribution. High power distance cultures emphasize hierarchy and authority, while low power distance cultures favor equality and open communication. 2. Individualism vs. Collectivism contrasts societies that prioritize individual goals and self-reliance (individualism) with those that emphasize group cohesion, loyalty, and collective interests (collectivism). 3. Masculinity vs. Femininity examines the degree to which a culture values traditionally masculine traits (e.g., competitiveness, ambition) versus feminine traits (e.g., nurturing, cooperation). Masculine cultures often focus on achievement, while feminine cultures prioritize quality of life and care for others. 4. Uncertainty Avoidance reflects a society’s

tolerance for ambiguity and uncertainty. High uncertainty avoidance cultures implement strict rules and procedures to manage unpredictability, whereas low uncertainty avoidance cultures are more flexible and open to change. 5. Long-Term vs. Short-Term Orientation distinguishes between cultures that plan for the future, value perseverance, and embrace pragmatism (long-term orientation) and those focused on tradition, immediate results, and social obligations (short-term orientation). 6. Indulgence vs. Restraint explores the extent to which a culture allows for the gratification of desires and enjoyment of life (indulgence) versus imposing strict social norms to curb such behaviors (restraint). Hofstede's dimensions have been widely used to analyze cultural differences in various domains, including food choices, organizational behavior, and cross-cultural communication [45].

Besides Hofstede's cultural dimensions, several theories provide insights into how culture interacts with dietary habits and food preferences. The Social Cognitive Theory [46] emphasizes the reciprocal interaction of personal, behavioral, and environmental factors. Observational learning and social norms play a crucial role in shaping dietary habits. For example, cultural traditions often dictate what is acceptable or desirable to eat. The Theory of Planned Behavior [47] highlights how attitudes, subjective norms, and perceived behavioral control influence intentions and behaviors, including food choice. Cultural factors significantly shape these elements, such as societal attitudes toward specific diets or consumption patterns. The Developmental Niche Theory [48] examines how the interplay between physical settings, cultural practices, and individual beliefs influences development, including dietary habits. It is particularly relevant for exploring childhood dietary practices shaped by cultural environments. The Social Practice Theory [49] explains food choice as embedded in everyday practices shaped by cultural routines and traditions. It emphasizes the habitual and context-driven nature of food consumption. Symbolic Interactionism [50]: This sociological perspective examines the symbolic meanings assigned to food within cultural contexts. For example, food can symbolize identity, tradition, or social status, influencing choices and behaviors. Acculturation Theory [51] explains dietary shifts among immigrants or multicultural populations, where traditional food habits are renegotiated within the host culture. This theory highlights the dynamic interaction between cultural heritage and new cultural norms. We used Hofstede's Cultural Dimensions for the following reasons: They provide a structured, universal framework for analyzing cultural differences, making them suitable for cross-cultural comparisons in food choice. The dimensions are extensively validated across disciplines, including marketing and psychology, providing robust theoretical grounding. Unlike other theories, Hofstede's framework explicitly addresses cultural value systems (e.g., individualism, uncertainty avoidance), which are directly relevant to dietary preferences and food-related behaviors. Hofstede's dimensions can complement theories like the Theory of Planed Bahavior or Acculturation Theory by providing cultural context to subjective norms and behavioral controls. The framework's insights are actionable for designing culturally sensitive dietary interventions, policies, and marketing strategies.

Recent scholarship highlights how frameworks such as Hofstede's cultural dimensions theory elucidate the interplay between cultural values and food choices in diverse contexts [52,53]. For example, Bahn et al. [53] explored how socio-cultural resources influenced food retail engagement in Lebanon during crises, underscoring the adaptive strategies rooted in cultural resilience. Similarly, [101] applied an expanded conceptual framework to investigate decision-making in agricultural systems, linking cultural norms to broader economic and environmental choices. These studies reinforce the pivotal role of cultural identity in shaping food preferences, further enriched by sensory marketing theories that reveal how ambient environmental cues can modulate food-related decisions [54]. Such integrative perspectives not only enhance understanding of cultural nuances in dietary habits but also inform sustainable and culturally sensitive dietary interventions.

The modern developed world has made food more accessible and affordable [55]. At the same time, culture evolves under the influence of historical changes, including globalization, technology uptake, social media, urbanization, leading several cultural aspects to become more homogenized [56]. Sproesser et al. [57] identified that food culture clusters in the modern eating practices vary less than in the traditional eating practices. On the other hand, individuals within the same population might be exposed to different cultural forces and might not have a homogenous and distinct cultural characteristic [36]. Even though, it is convinced that a nation is a meaningful unit of culture with a significant gravitational center [36]. People might adopt modern food practices due to various reasons such as health promotion, convenience, indulgence, and diversity; but also, prefer to consume foods that are associated with their own culture, in order to preserve their cultural identity and strengthen their sense of belonging [57,58]. Culture's impact on consumption behavior in international market is found to be greatest for food products compared to other product categories [59].

While it is known that cultural values and dimensions affect food choices [31], little attention has been paid to how they correlate with consumers' food preferences and the relative importance of different attributes. Given the emergency of environmental and health issues worldwide, it is beneficial to understand food choice from a cross-cultural perspective. Chocolate was chosen as the focus of this study due to its unique position in global food consumption and its relevance to sustainable food systems. As a widely consumed product with significant cultural and economic importance, chocolate provides a rich context for examining how product attributes and cultural values influence food choices. The production of chocolate involves complex supply chains that impact environmental sustainability, including issues related to deforestation, carbon emissions, and fair-trade practices [60,61]. Additionally, chocolate's diverse range of attributes, such as flavor, origin, and ethical certifications, makes it an ideal candidate for discrete choice experiments (DCE) to uncover consumer preferences [62]. By focusing on chocolate, this study aims to provide insights that are not only relevant to consumer behavior but also to broader discussions on promoting sustainable consumption patterns.

Chocolate is available and consumed worldwide. It is primarily consumed for its hedonic benefits and regarded as an indulgent treat that represents affordable luxury [63]. Many chocolate creations have been made to satisfy the diverse demands of consumers in terms of flavor, texture, and form. The unique sensory features of the resulting products depend on cocoa origin, composition, and manufacturing procedure [61]. The main chocolate classifications are dark chocolate, Gianduja chocolate, milk chocolate, and white chocolate. They contain different amounts of cocoa and sugar, which decisively impact the sweetness, bitterness, and health effects of the final products [64]. Many components in cocoa such as polyphenols, alkaloids, and minerals contribute to the health benefits of chocolate, by possessing biological properties including antioxidant, antiproliferative, anti-inflammatory [65]. Researchers also found that consuming cocoa-rich products may improve affect and mood in the short term and increase emotions of pleasure and happiness [66]. However, only chocolate with high percentages of cocoa and low content of sugar should be associated with health-promoting effects [64]. Milk and white chocolates, on the other hand, are less healthy and contribute to higher sugar and fat intake [67].

Chocolate is often consumed for personal gratification or purchased as a gift and is typically bought on impulse; furthermore, for some people, chocolate is even seen as a comfort food [62]. It is not surprising that taste is agreed to be the most important factor in chocolate choices [62,63,67]. Emotional marketing communication has been a typical tool used by marketers for chocolate confectioneries [68]. However, as consumers are increasingly concerned with sustainability, ethics, and health issues, the attributes involved in their choice have expanded [67]. Although the type of chocolate, brand, aroma/taste, and price are major considerations in chocolate purchase; other attributes including origin, labels, packaging, and portion size also have influences on the product choices [67,68]. A literature review by Del Prete and Samoggia

[62] identified important attributes that define chocolate, such as country of origin, brand, labels, certifications, packaging, portion size, and price. These attributes, along with taste and health preferences, significantly influence chocolate purchasing decisions. To date, several studies have investigated consumer segmentation based on consumer chocolate preferences in relation to lifestyle, food habits and socio-demographic features [68], brand loyalty [63] and ethical considerations [60]. However, there is little research investigating cultural influences on chocolate choices. Based on the review above, the following hypotheses are proposed.

H1. Health consciousness has a positive impact on consumer preference for dark chocolate.

H2. Environmental consciousness has a positive impact on the attributes related to environmental sustainability (measured by sustainable packaging materials and sustainability labels).

H3. Local company's origin has a greater effect on chocolate choices of consumers who are more ethnocentric/patriotic.

The aim of this study is to provide novel insight into sustainable food choice and the influence of different product attributes on consumer food preferences in a cross-cultural perspective. A web-based hypothetical choice experiment using visual stimuli was conducted to simulate a shopping situation in which consumers must decide between different product alternatives. Discrete choice experiments (DCE) have become popular in food research for their ability to reveal how consumers balance different product attributes, particularly credence attributes. For instance, Sepúlveda et al. [69] used DCE to study the effects of organic and ethical production, cocoa content, origin, antioxidant content, cocoa type, and price on dark chocolate preferences in Ecuador and Spain. In DCE, respondents choose from sets of product alternatives, each with different combinations of characteristics, repeating this task across several sets. The consumers of each country will be further described using a modified scale that measures individual cultural values. The paper will be structured as follows: the next section describes the materials and methods used in the study. The results of the choice experiment and the profiling questionnaire will be presented in the third section. In the discussion, the results will be critically examined. Finally, the findings will be summarized in the conclusion and further implications for policy planning, marketing, product development, and future research fields will be noted.

2. Materials and methods

2.1. Data collection and survey design

The aim of this study is to analyze consumers' preferences when buying chocolate and how they vary among countries. Six countries of different cultures and geographical regions were chosen for this survey, including Vietnam, Iran, Germany, Greece, Turkey, and Venezuela. A web-based questionnaire was designed in English, then translated into languages spoken in the selected countries. Participants were recruited on social media (Facebook, Instagram, and WhatsApp) in May 2023 and got access to the online survey via links distributed by the authors. Participation in the survey was voluntary and respondents could exit the survey at any time without facing negative consequences. As the research was focused on young consumers, respondents under 35 years were actively invited to answer the survey; older participants were also accepted for data collection. A minimum of 40 completed surveys for each country was ensured, adhering to the recommendation for sufficient sample sizes in choice experiments involving discrete attributes. This threshold aligns with standards cited by Sawtooth Software, which posits that reliable estimation of main effects in discrete choice models is achievable with approximately 30–50 respondents per segment when balanced overlap designs and orthogonal principles are employed [70]. A total of 412 respondents completed the survey, and their data were utilized for further analysis. Data from respondents who were disqualified due to incomplete answers or speed settings were excluded from the dataset.

The questionnaire was divided into three sections. In the first section, respondents answered socio-demographic questions concerning age, country of origin, gender, and income. The second section consisted of a choice experiment. Respondents were required to choose their preferred product from three different product options with alternated attribute levels and a no-choice option. In the third section, respondents had to state their level of agreement with different attitudes that reflect psychographic characteristics related to cultural and personal values on a five-point scale ranging from fully disagree (1) to fully agree (5). Further details on these measures are given in section 2.4.

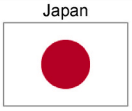
2.2. Design of the discrete choice experiment

To identify the impacts of different attributes on the choice of chocolate, a discrete choice experiment was designed and conducted using Sawtooth Software (version 9.15.9).To make the research relevant for the selected countries, attributes and attribute levels, including the pictures used, were discussed with students from the countries under investigation prior to the survey. The pictures were the same for all countries except for the picture for the attribute level local where for each country their flag was shown. The pictures used are license free and found on iStock. In the present choice experiment, the attributes considered for a 100g chocolate bar were price, type, origin of the company, label, packaging material and flavor. Table 1 summarizes the attributes and attribute levels employed in the choice experiment.

Sustainable product characteristics in this study were defined and measured using specific attributes related to environmental and ethical considerations. These attributes included the type of packaging material (plastic, paper, metal, wood, no packaging) and the presence of sustainability-related labels (vegan, no palm oil, no sugar added, organic (BIO), climate friendly). Packaging materials were chosen to represent varying levels of environmental impact, with plastic being the least sustainable option and no packaging being the most sustainable. The labels were selected to reflect different aspects of sustainability, such as environmental friendliness (climate friendly), ethical production (no palm oil, organic), and health-related benefits (vegan, no sugar added).

The choice experiment asked respondents to choose between three product alternatives. Respondents should indicate which product alternative they would intend to buy. Moreover, in each choice set, a no-choice option was included to allow respondents to refuse to choose any product. The combination of attribute levels for each product profile and choice set was generated by an experimental design. Because using the full-choice design of all possible combinations of attribute levels was not empirically feasible, Sawtooth Software was used to identify a reduced design that approximates maximum D-efficiency [71]. Sawtooth Software's shortcut scheme was used to sample subsets of the full-choice design. The resulting designs are nearly orthogonal, because a unique randomized design is generated for each respondent [71]. The following choice-based conjoint (CBC) design settings were chosen: We used 12 random tasks and no fixed tasks with three concepts per task (excluding the none-option). For the none-option we used the traditional design (no dual-response). The random task generation method was balanced overlap. In the context of choice experiments using Sawtooth Software, balanced overlap refers to a design strategy that manages the repetition of attribute levels across alternatives within a choice task. It strikes a middle ground between minimal overlap, which ensures attribute levels rarely repeat but might make tasks feel artificial, and full randomization, which can lead to excessive repetition and redundancy. Balanced overlap allows for some repetition of attribute levels within a task while maintaining diversity across the experiment, creating a more natural and realistic choice environment. This approach enhances statistical efficiency, ensures the tasks are engaging and intuitive for respondents, and improves the overall quality of the data collected. We generated 300

Table 1
Attributes and attribute levels used in the choice experiment (example Greece).

Attributes	Attribute Levels				
Price	≤ 0.50 €	1.00 €	1.50 €	2.00 €	2.50 €
Type	White > 20%*	Milk > 25%*	Dark milk > 50%*	Dark 50-90%*	Raw = 100%*
					
Origin of the company	Local	Japan	Switzerland	USA	Italy
					
Label	Vegan	No palm oil	No sugar added	Organic (BIO)	Climate friendly
					
Packaging	Plastic	Paper	Metal	Wood	No packaging
					
Flavor	No added flavor	Caramel	Fruity	Nut	Mint
					
Non-option	No purchase				

Note. * cocoa solids.

questionnaire versions (design seed = 1) with none attribute randomization and none concept sorting. The response type was discrete choice. We tested the design including one-way and two-way frequencies with the specifications advanced test (simulated data, logit efficiency test, and D-efficiency) with 300 generated respondents (percent none = 15) and legacy OLS efficiency test. A general guideline is to achieve standard errors of 0.05 or smaller for main effect utilities and 0.10 or smaller for interaction effects or alternative-specific effects. The highest standard error in the test was 0.04668 for the none-option. The strength of design for this model is 759.968533360553 (The ratio of strengths of design for two designs reflects the D-Efficiency of one design relative to the other.). Overall, the choice experiment contains 12 choice tasks per respondent. Pictures were used to demonstrate the information in a simple and concise manner.

2.3. Statistical methods: hierarchical bayes model and regression analysis

First, socio-demographic data of each country were analyzed using SPSS. This was followed by the analysis of the discrete choice experiment in Sawtooth Software 9.15.9. To identify consumers' average preferences in terms of price, type, origin of the company, label, packaging, and flavor, the hierarchical Bayes model was used. The Hierarchical Bayes (HB) model helps to solve the limited data problem at the individual level and gives a more accurate estimation [72]. HB analysis in Sawtooth Software is a statistical technique used to estimate individual-level preferences (part-worth utilities) from discrete choice experiment data. It works by combining information from each respondent's choices with overall patterns observed in the data, effectively balancing individual-level detail with population-level insights. HB analysis uses a hierarchical structure with two levels, an individual level which assumes each respondent has their own set of preferences, expressed as part-worth utilities for different attribute levels and a population level which assumes these individual preferences are drawn from a common distribution (e.g., multivariate normal) that characterizes the entire population. The analysis applies Bayes' theorem to estimate part-worth utilities. It starts with a prior distribution, reflecting assumptions about the population's preferences before considering the data, and updates this with likelihoods derived from the respondents' choice data. HB uses a Markov Chain Monte Carlo simulation to iteratively estimate the parameters. The method alternates between estimating the population-level parameters (mean and covariance of the utility distribution) based on the current individual-level estimates, updating the individual-level part-worth utilities by considering each respondent's choices, and the population-level distribution and customization to respondent data. As the model iterates, it refines the estimates by borrowing strength from the population-level data to inform individual-level predictions, particularly for respondents with limited data. HB provides a set of part-worth utilities for each respondent, reflecting their preferences for each attribute level. These utilities can be used to predict individual and group-level choices, simulate market scenarios, and calculate derived measures like willingness-to-pay or importance scores.

Next, to identify cultural differences among countries, the participants of each country were further profiled regarding their psychographic characteristics. Based on a literature review, 50 questionnaire items were compiled and used in the present study to capture respondents' attitudes towards different cultural aspects. 26 items to measure Hofstede's cultural dimensions at the individual level were adopted directly from Yoo et al. [73]. To obtain a deeper insight into individual shopping habits, items measuring personal health consciousness and quality consciousness were added. Items used were based on the research of Gunarathne et al. [74]. Lastly, to analyze how much a person consumes a product because of its positive social value, items measuring environmental consciousness, conspicuousness and prestige value, and patriotism were included. They were adopted from Thormann et al. [75], Hennigs et al. [76] and Billings et al. [77]. An overview of all items used is given in Table 4. We used factor analysis with Principal Component Analysis (PCA) as the extraction method and Varimax with Kaiser Normalization as the rotation method to identify latent factors (the psychographic constructs) by simplifying patterns of relationships among observed variables (items). PCA extracts factors by transforming the data into components that explain the most variance,

reducing dimensionality. Varimax rotation then redistributes this variance to clarify factor structure, making variables load strongly on one factor for easier interpretation. Kaiser normalization ensures factors are on the same scale during rotation, leading to a balanced and interpretable factor solution.

Finally, to evaluate the relationship between product attributes and cultural and individual values, regression analysis was conducted with SPSS. Some of the outcomes are discussed in section 3.5.

3. Results

This section presents the findings of the study, structured to align with its aim of exploring the influence of cultural and individual values on consumer preferences for chocolate. The results are organized into four main parts. First, descriptive statistics provide an overview of the socio-demographic characteristics of respondents across the six countries, offering context for the subsequent analyses. Second, the outcomes of the discrete choice experiment are detailed, highlighting the relative importance of product attributes and preferences for attribute levels within each country. This directly addresses the first and second hypotheses concerning health consciousness and environmental consciousness. Third, psychographic constructs are analyzed, offering insights into the cultural and personal values that shape consumer behavior, and connecting these insights to the third hypothesis. Finally, regression analyses reveal the relationship between these constructs and specific product attribute preferences, providing deeper evidence for the hypothesized impact of cultural values such as ethnocentrism and patriotism on local product preferences. Together, these results illuminate cross-cultural variations and provide empirical evidence supporting the proposed hypotheses.

3.1. Sample description

The collected data was analyzed by socio-demographic factors, as shown in Table 2. The respondents were grouped by countries. Around one-third of the total respondents are from Turkey. The shares of participants from the other five countries range from 11.2 % to 15.7 %. The difference in quantity of respondents did not affect the results, as the data of each country was analyzed separately.

In total, more women than men and LGBTQ + people took part in the survey. In only two of the six countries (Iran and Germany), the share of male respondents is greater than the share of female respondents. It is noteworthy that Vietnam has significantly more female participants than male participants, compared to other countries. Furthermore, there were only eight LGBTQ + respondents in the survey, all of whom are Turkish. In terms of age, Iranian respondents have an average age of 29.51 years, which is significantly higher than respondents from the other five countries (average age range: 21.50–24.56 years).

3.2. Results of the hierarchical bayes model

The hierarchical Bayes model was used to discover consumers' average preferences for chocolate in terms of price, type, origin of the company, label, packaging, and flavor. The columns in Figs. 1–6 illustrate the estimated part-worth utilities for each level in the relevant attribute group; a higher part-worth utility represents greater benefit for the consumers. This, in turn, indicates a greater likelihood of purchasing the chosen product. Additionally, the relative importance of each attribute is given in parentheses.

3.2.1. Vietnam

Vietnamese consumers prioritize type of chocolate, packaging, and flavor when choosing chocolate. They prefer dark chocolate and favor chocolate without packaging, indicating a preference for handcrafted chocolate sold in specialized stores. Natural packaging materials like paper and wood are preferred over metal and plastic. In terms of flavor, they like plain chocolate and chocolate with caramel. The origin of the company is also important, with a preference for local (Vietnamese), Swiss, and Japanese chocolate. Labels have slightly less influence, with "climate friendly" being the most beneficial and "no palm oil" the least. Price is the least relevant attribute, with the preferred price for a 100g chocolate bar being 1.00 Euro. In summary, the most preferred product for an average Vietnamese consumer is local dark chocolate with a "climate friendly" label, no packaging, and priced at 1.00 Euro per 100g.

3.2.2. Iran

Iranian consumers prioritize type of chocolate, flavor, and price when purchasing chocolate. They prefer chocolate with high cocoa content, especially chocolate with nuts. White chocolate and chocolate with mint are the least favored. Regarding price, they favor low prices, with the highest preference for 0.50 Euro per 100g, though 2.00 Euro is also positively rated. The origin of the company, packaging, and label have relatively low impacts. They prefer imported chocolate over local, with a preference for Swiss and Italian companies. In terms of packaging, they favor prepackaged products, especially those in metal and wood over paper and plastic. For labels, "climate friendly" is the most beneficial, while "no sugar added" is the least. In summary, the most preferred product for an average Iranian consumer is Swiss dark milk chocolate with nuts, packaged in metal, labeled "climate friendly", and priced at 0.50 Euro per 100g.

3.2.3. Germany

German consumers prioritize type of chocolate and flavor when choosing chocolate. They prefer milk chocolate, followed by dark milk and dark chocolate. White chocolate is favored over raw chocolate, but both have low part-worth utilities compared to other types. In terms of flavor, they prefer plain chocolate, chocolate with nuts, and chocolate with caramel. Mint and fruity flavors are less favored. The origin of the company and price are equally important. German consumers prefer Swiss and local (German) chocolate and favor prices under 2.00 Euro (0.50–1.50 Euro). The least important attributes are label and packaging. They find "vegan" labels and paper packaging appealing, while rejecting "no sugar added" labels and plastic packaging. In summary, the ideal chocolate bar for an average German consumer is vegan Swiss milk chocolate that costs 1.00 Euro per 100g and has paper packaging.

3.2.4. Greece

Greek consumers prioritize type of chocolate and flavor when choosing chocolate. They prefer milk chocolate and chocolate with caramel, while having a negative attitude towards raw chocolate and mint chocolate. Packaging and price are the next important criteria. They prefer wooden packaging, followed by paper and metal, and prefer

Table 2
Sample description (N = 412).

Variable	Levels/Unit of Measurement	Vietnam (11.7 %)	Iran (15.7 %)	Germany (14.8 %)	Greece (14.3 %)	Turkey (32.3 %)	Venezuela (11.2 %)
Gender (%)	Male	8 (16.7 %)^{a}	38 (58.5 %)^{b}	34 (55.7 %)^{b}	23 (39.0 %)^{a,b}	37 (27.8 %)^{a,b}	22 (47.8 %)^{b}
	Female	40 (83.3 %)^{a}	27 (41.5 %)^{b}	27 (44.3 %)^{b}	36 (61.0 %)^{a,b}	88 (66.2 %)^{a,b}	24 (52.2 %)^{b}
	Diverse	0 (0.0 %)a	0 (0.0 %)^{b}	0 (0.0 %)^{b}	0 (0.0 %)^{a,b}	8 (6.0 %)^{a,b}	0 (0.0 %)^{b}
Age (Mean (SD))	Years	24.56 (5.153)a	29.51 (6.163)^{b}	23.90 (8.671)^{a}	22.00 (5.360)^{a}	21.50 (6.616)^{a}	22.82 (2.985)^{a}

Note. Superscripts stand for significant mean differences at the 0.05 level based on Tukey testing.

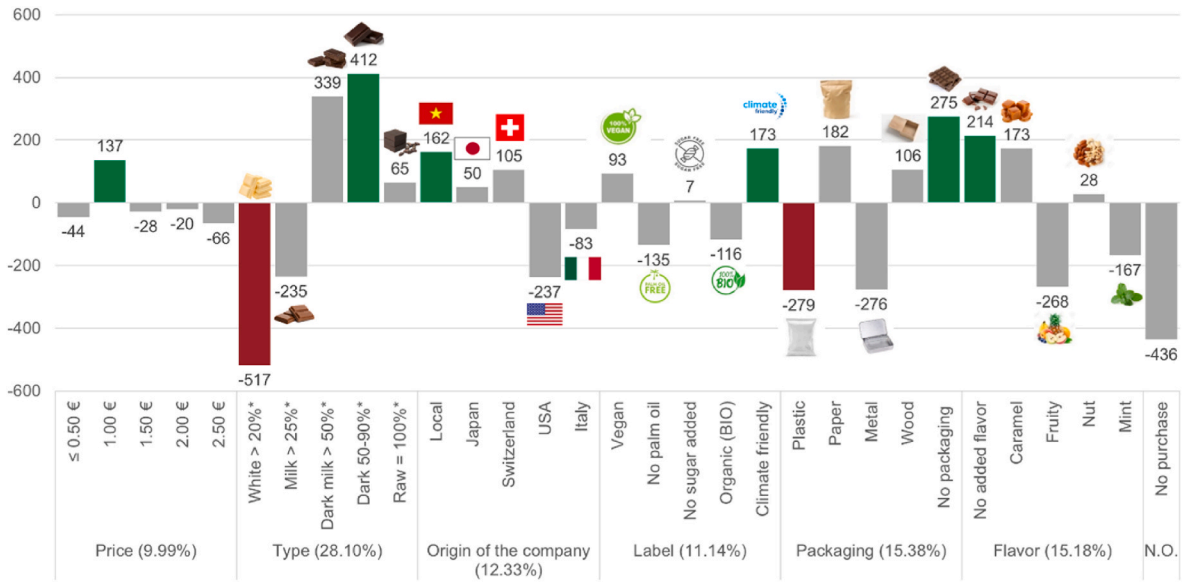


Fig. 1. Part-worth utilities as result of the conjoint analysis based on the choice-experiment data (Vietnam). Relative importance in parentheses.

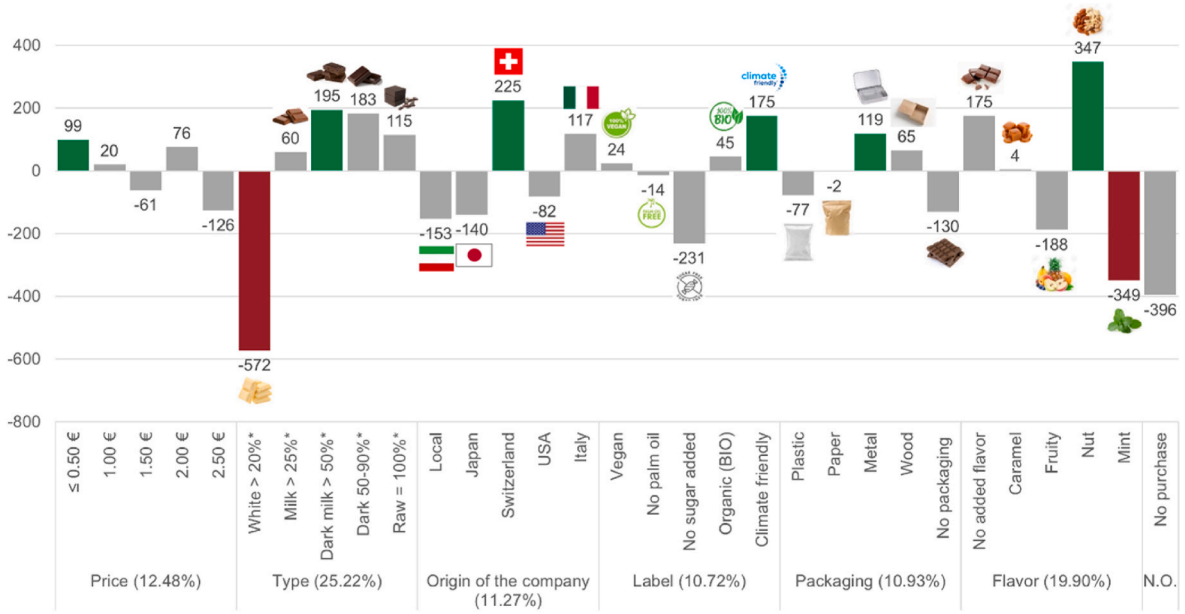


Fig. 2. Part-worth utilities as result of the conjoint analysis based on the choice-experiment data (Iran). Relative importance in parentheses.

no packaging over plastic. The best price option is 0.50 Euro, though 2.50 Euro is also rated positively. The origin of the company has slightly less influence, with a preference for locally produced chocolate, followed by Swiss chocolate. The least influential attribute is label, with a preference for organic labels. In summary, the most preferred chocolate for an average Greek consumer is locally, organically produced milk chocolate with caramel, packaged in wood, and priced at 0.50 Euro per 100g.

3.2.5. *Turkey*

Turkish consumers prioritize type of chocolate and flavor when choosing chocolate. They prefer milk chocolate, followed by white chocolate and dark milk chocolate. Chocolates with nuts and caramel are highly favored, while raw chocolate and mint chocolate are the least preferred. Packaging and origin of the company are the next important attributes. They prefer paper packaging and local products. Among imported chocolates, those from Switzerland and Italy are equally favored. Price and label are the least important factors. Consumers prefer cheaper chocolate. Among labels, “no palm oil” is the most beneficial, while “no sugar added” is the least beneficial. In summary, the most preferred product for an average Turkish consumer is milk chocolate with nuts, produced by a local company, with paper packaging and a “no palm oil” label, priced at 0.50 Euro per 100g.

3.2.6. *Venezuela*

Venezuelan consumers prioritize flavor over type when choosing chocolate. They dislike mint chocolate and prefer chocolate with no added flavor. Their favorite type is dark milk chocolate, while sweeter and darker varieties are less preferred. The origin of the company ranks third in importance. They have a strong preference for local products, with local chocolate significantly favored over imported ones. Among imported chocolates, those from Italy are preferred over Swiss

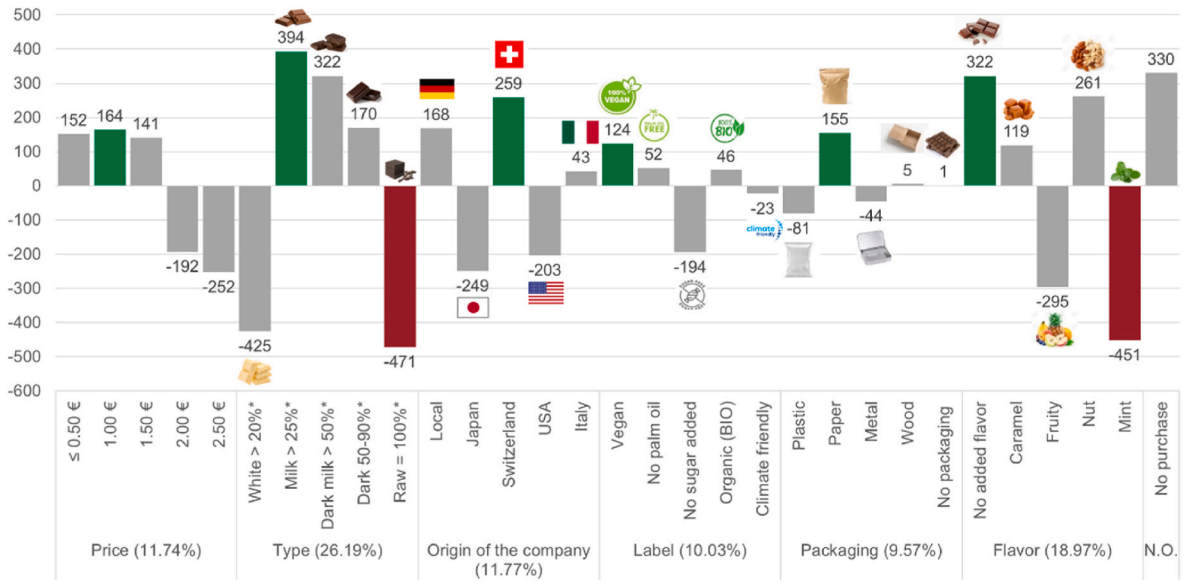


Fig. 3. Part-worth utilities as result of the conjoint analysis based on the choice-experiment data (Germany). Relative importance in parentheses.

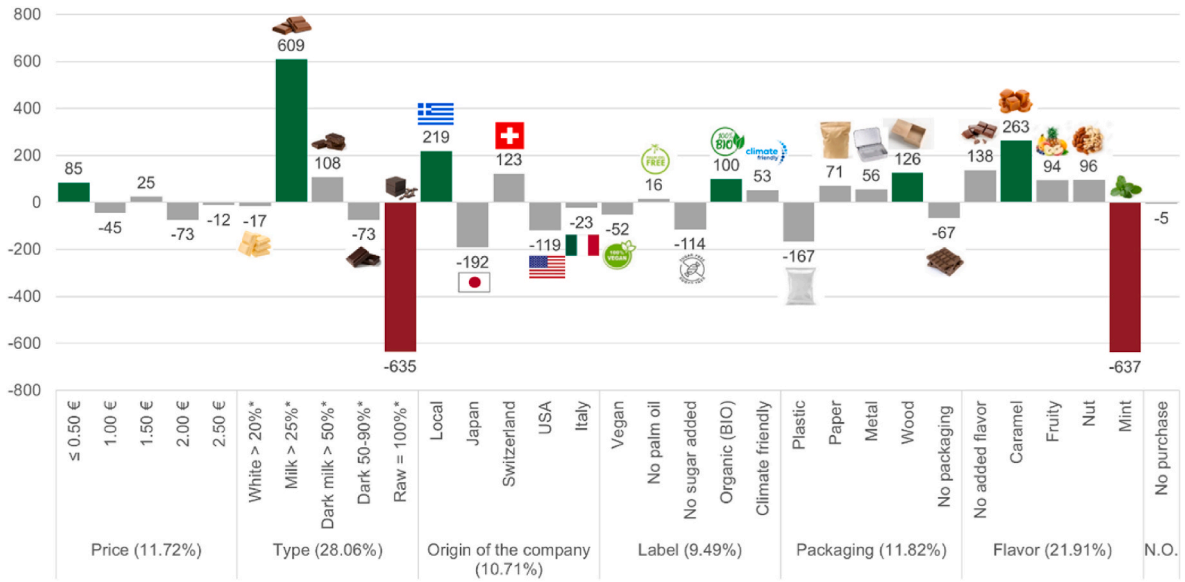


Fig. 4. Part-worth utilities as result of the conjoint analysis based on the choice-experiment data (Greece). Relative importance in parentheses.

chocolates. Packaging and label are the next important attributes, with metal packaging and organic labels receiving the highest part-worth utilities. Plastic packaging and "no palm oil" labels are less favored. Price is the least influential factor, with the best price option being 1.00 Euro per 100g. In summary, the most preferred product for an average Venezuelan consumer is organic dark milk chocolate with no added flavor, made in Venezuela, packaged in metal, and priced at 1.00 Euro per 100g.

3.3. *Part-worth utilities for the six countries*

The results of the hierarchical Bayes model for the six countries are presented in Table 3. At the end of the table, the relative importance shows how strongly the variations of attributes influence consumers' decisions for the levels chosen in the design.

Overall, there are noticeable similarities among the six countries. First and foremost, they all lay great importance on type and flavor when choosing chocolate. In this survey, the relative importance of these two attributes adds up to about 50 %. Price, origin of the company, label, and packaging, on the other hand, only play supplementary roles. However, it should be noted that depending on the countries, some of these attributes might have stronger influence than the others. For instants, price is the third important criterion in choice of Iranian respondents after type and flavor, whereas it is the least important attribute for Vietnamese and Venezuelan respondents. Interestingly, some consistent patterns can be identified across the investigated countries. Information about the company's origin is generally more important than labels. Most countries demonstrated a preference for local chocolate and Swiss chocolate. Moreover, they all tend to choose alternatives to plastic packaging and prefer lower prices. Nonetheless, there are significant differences among the countries. In particular, the individual part-worth utilities of attribute levels regarding chocolate type, labels, and packaging materials vary widely. Without doubt, national cultures are present in food choice, in which each country has its own characteristic preferences.

Cultural differences in the relative importance of product attributes

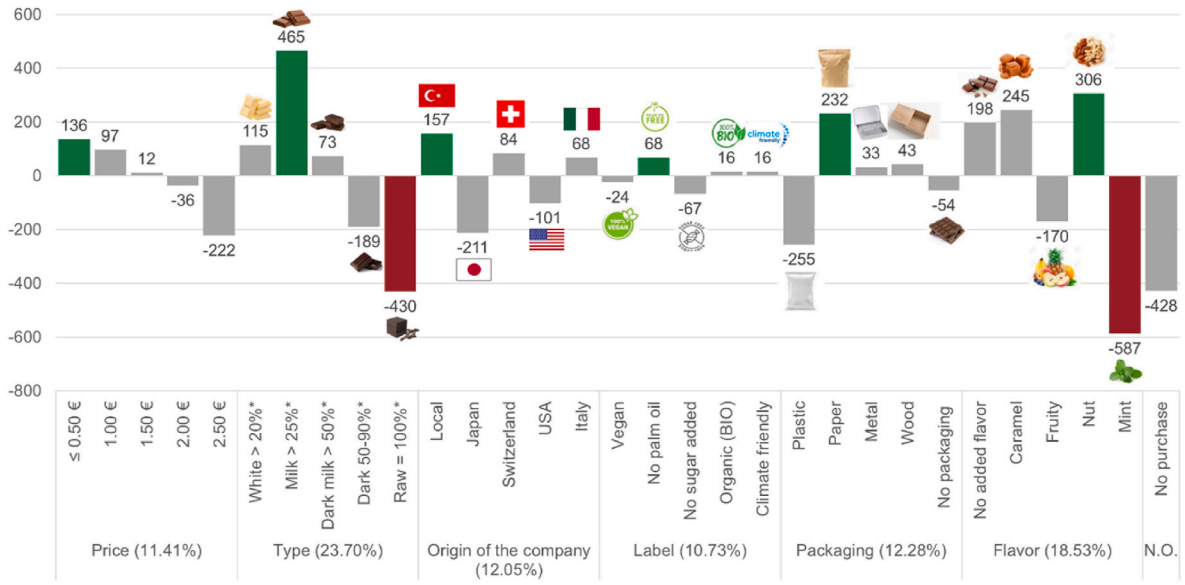


Fig. 5. Part-worth utilities as result of the conjoint analysis based on the choice-experiment data (Turkey). Relative importance in parentheses.

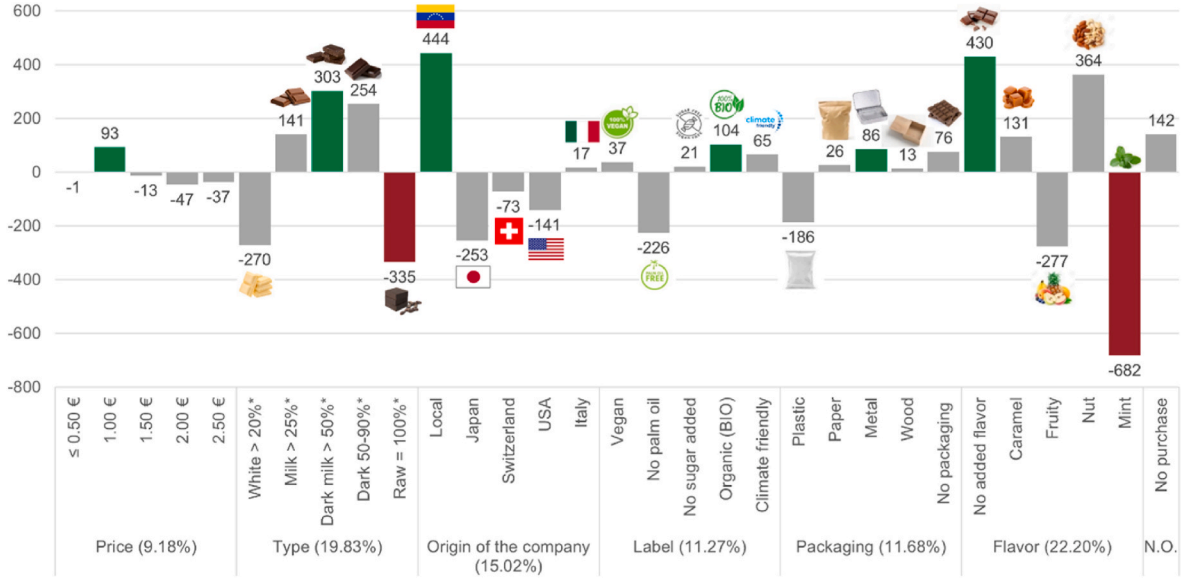


Fig. 6. Part-worth utilities as result of the conjoint analysis based on the choice-experiment data (Venezuela). Relative importance in parentheses.

were identified through a detailed analysis of the part-worth utilities derived from the hierarchical Bayes model, as presented in Table 3. Significant differences in these scores were determined using Tukey's test at the 0.05 level, as indicated by superscripts in Table 3. The relative importance of price showed significant differences among the countries. Iranian participants (12.48 %) and Turkish participants (11.41 %) placed a higher importance on price compared to Venezuelan participants (9.18 %). This indicates that price sensitivity is more pronounced in Iran and Turkey, possibly due to economic conditions. In contrast, Venezuelan consumers are less price-sensitive, suggesting a willingness to pay more for preferred attributes. The type of chocolate was a highly significant attribute for all countries, but its importance varied. Greek participants placed one of the highest importances on chocolate type (28.06 %), significantly more than Turkish participants (23.70 %) and Venezuelan participants (19.83 %). This indicates that Greek consumers have strong preferences for specific chocolate types, which could be influenced by cultural tastes and traditions. Vietnamese participants also placed high importance on chocolate type (28.10 %), grouping them with Greek participants in terms of significance. The origin of the chocolate company was more important for Venezuelan participants (15.02 %) compared to Turkish participants (12.05 %) and Iranian participants (11.27 %). Venezuelan consumers showed a strong preference for local products, reflecting a sense of patriotism and support for domestic brands. In contrast, Iranian consumers placed less importance on the origin, possibly due to a preference for imported goods perceived as higher quality. The importance of labels was relatively consistent across countries, with no significant differences. This suggests that while labels are considered in the decision-making process, they do not vary greatly in importance between cultures. Packaging was significantly more important for Vietnamese participants (15.38 %) compared to Iranian (10.93 %), German (9.57 %), Greek (11.82 %), and Turkish (12.28 %) participants. This indicates a cultural preference in Vietnam for certain packaging types, possibly reflecting environmental concerns, the warm tropic climate, or aesthetic preferences. German participants, with the lowest importance for packaging prioritize other attributes such as type and flavor. Flavor was a crucial attribute for all countries,

Table 3
Part-worth utilities (zero based) for the different subsamples (N = 412).

Attribute	Levels	Vietnam (11.7 %)	Iran (15.7 %)	Germany (14.8 %)	Greece (14.3 %)	Turkey (32.3 %)	Venezuela (11.2 %)
Price	≤0.50 €	22^{a}	$225^{a,b,c}$	404^{c}	$98^{a,b,c}$	$358^{b,c}$	$36^{a,b}$
	1.00 €	$203^{b,c}$	$146^{a,b}$	416^{c}	-33^{a}	$319^{b,c}$	$130^{b,c}$
	1.50 €	38^{a}	65^{a}	392^{b}	37^{a}	234^{a}	23^{a}
	2.00 €	$46^{b,c}$	202^{c}	59^{a}	$-61^{a,b}$	$185^{b,c}$	$-10^{b,c}$
	2.50 €	0^{b}	$0^{a,b}$	0^{a}	0^{b}	0^{a}	0^{b}
Type	White >20 %[a]	0^{a}	0^{a}	0^{a}	$0^{b,c}$	0^{c}	$0^{a,b}$
	Milk >25 %[a]	282^{a}	632^{b}	$819^{c,d}$	626^{d}	349^{d}	$411^{b,c}$
	Dark milk >50 %[a]	856^{c}	$767^{a,b,c}$	$747^{b,c}$	$125^{a,b}$	-43^{a}	$573^{b,c}$
	Dark 50–90 %[a]	929^{c}	$755^{b,c}$	595^{b}	-56^{a}	-304^{a}	$525^{b,c}$
	Raw = 100 %[a]	582^{c}	687^{c}	$-46^{a,b}$	-618^{a}	$-546^{a,b}$	-65^{b}
Origin of the company	Local	112^{b}	-14^{a}	417^{b}	411^{b}	368^{b}	697^{c}
	Japan	0^{b}	0^{a}	0^{a}	0^{a}	0^{a}	0^{a}
	Switzerland	$55^{b,c}$	$365^{c,d}$	508^{d}	$316^{b,c}$	295^{b}	180^{a}
	USA	-287^{a}	57^{b}	$46^{a,b}$	$73^{a,b}$	110^{b}	$112^{a,b}$
	Italy	-132^{a}	257^{c}	$292^{b,c}$	$170^{a,b}$	$279^{b,c}$	$270^{a,b,c}$
Label	Vegan	$86^{a,b}$	$255^{a,b}$	318^{b}	62^{a}	$42^{a,b}$	$15^{a,b}$
	No palm oil	$-142^{a,b}$	$217^{b,c}$	246^{c}	130^{c}	135^{c}	-247^{a}
	No sugar added	$0^{c,d}$	0^{a}	$0^{a,b}$	$0^{a,b,c}$	$0^{b,c,d}$	0^{d}
	Organic (BIO)	-123^{a}	276^{b}	239^{b}	214^{b}	83^{b}	82^{b}
	Climate friendly	166^{b}	405^{b}	171^{a}	166^{a}	83^{a}	$44^{a,b}$
Packaging	Plastic	0^{a}	0^{b}	0^{b}	$0^{a,b}$	0^{a}	$0^{a,b}$
	Paper	$461^{c,d}$	74^{a}	$236^{b,c,d}$	$238^{a,b,c}$	486^{d}	$211^{a,b}$
	Metal	3^{a}	196^{c}	37^{b}	$223^{b,c}$	$287^{b,c}$	272^{c}
	Wood	$385^{a,b}$	$141^{a,b}$	86^{a}	293^{b}	$298^{a,b}$	$199^{a,b}$
	No packaging	554^{c}	-53^{a}	$82^{a,b}$	$100^{a,b}$	$200^{a,b}$	262^{b}
Flavor	No added flavor	$482^{a,b}$	$363^{a,b}$	$617^{b,c}$	44^{a}	$368^{a,b}$	707^{c}
	Caramel	$441^{a,b}$	192^{a}	$415^{a,b}$	169^{b}	415^{b}	$408^{a,b}$
	Fruity	0^{a}	0^{a}	0^{a}	0^{b}	0^{a}	0^{a}
	Nut	296^{a}	535^{c}	$557^{b,c}$	$2^{a,b}$	476^{c}	641^{c}
	Mint	100^{c}	$-161^{b,c}$	$-156^{a,b}$	-731^{a}	$-417^{a,b}$	-405^{a}
N.O.	No purchase	-436^{a}	-396^{a}	330^{b}	-5^{b}	-428^{a}	142^{b}
Relative importance (%)	Price	$9.99^{a,b}$	12.48^{b}	$11.74^{a,b}$	$11.72^{a,b}$	$11.41^{a,b}$	9.18^{a}
	Type	28.10^{b}	$25.22^{a,b}$	26.19^{b}	28.06^{b}	$23.70^{a,b}$	19.83^{a}
	Origin of the company	$12.33^{a,b}$	11.27^{a}	$11.77^{a,b}$	10.71^{a}	$12.05^{a,b}$	15.02^{b}
	Label	11.14^{a}	10.72^{a}	10.03^{a}	9.49^{a}	10.73^{a}	11.27^{a}
	Packaging	15.38^{b}	10.93^{a}	9.57^{a}	11.82^{a}	12.28^{a}	11.68^{a}
	Flavor	15.18^{a}	$19.90^{a,b}$	$18.97^{a,b}$	21.91^{b}	$18.53^{a,b}$	22.20^{b}

Note. Superscripts stand for significant mean differences at the 0.05 level based on Tukey testing.
[a] Cocoa solids.

with significant differences observed. Venezuelan participants placed the highest importance on flavor (22.20 %), significantly more than Greek (21.91 %) and Turkish (18.53 %) participants. This suggests that Venezuelan consumers have strong preferences for specific flavors, which could be influenced by local culinary traditions and taste preferences. These significant differences, indicated by superscripts in Table 3, highlight how cultural values and local market conditions shape consumer preferences.

Regarding chocolate type, some countries prefer sweet variations, while others like chocolates with high cocoa contents. In details, consumers in two Asian countries of this survey (Vietnam and Iran) enjoy the bitterness of chocolate and prefer dark and dark milk types. Additionally, unlike the other four nations where raw chocolate is the least desired option, in these two countries, raw chocolate is preferred over sugary types like white and milk chocolate. In contrast, consumers in European countries (Germany, Greece, and Turkey) prefer sweeter variations. Milk chocolate is the most preferred type, chocolates with higher cocoa contents received lower part-worth utilities. Moreover, white chocolate is significantly more preferred by Turkish and Greek respondents than respondents from other countries. It ranked the second favorite in Turkey and the third favorite in Greece. However, white chocolate is not as favored by German consumers. In Germany, its part-worth utility is almost as low as that of raw chocolate. In Venezuela, the type of chocolate influences consumers' decisions less than in other countries. Venezuelan consumers prefer chocolate with medium amount of cocoa, and possibly like both chocolate sweet and bitter tastes.

In terms of flavors, the participants mutually classified three varieties as preferable: just plain chocolate with no added flavor, chocolate with caramel, and chocolate with nuts, and two varieties as less preferable: chocolate with fruits and chocolate with mint. It is notable that, fruity flavor is significantly more favored in Greece than in other countries. On the other hand, mint was more favored in Vietnam. However, obtaining the lowest part-worth utilities, mint chocolate is clearly not a popular chocolate combination in the other five countries.

When it comes to the company's origin, consumers typically prefer domestic chocolate producers to foreign ones. It is especially noticeable in the data obtained in Venezuela. Only in Iran, local chocolate is not as favored to imported chocolate. Among the foreign chocolate companies chosen for this survey design, Swiss chocolate makers gained the most positive responses. German consumers even prefer Swiss chocolate over their local chocolate. Only in Venezuela, Italian chocolate is perceived as superior to Swiss chocolate. It is also notable that Japanese chocolate, which is not a preferred option in the other countries, is highly favored in Vietnam, ranking third just after local and Swiss chocolate.

In terms of packaging, consumers tend to choose non-plastic packaging options. German and Turkish respondents prefer paper packaging, while Iranian and Venezuelan respondents prefer metal packaging. For Greek consumers, wood packaging is the most appealing alternative. On the other hand, Vietnamese participants showed a great preference for no packaging. Additionally, packaging criterion is significantly more influential for Vietnamese consumers than consumers in other countries.

In terms of price, consumers generally prefer lower prices. Iranian respondents are the most price conscious, while Venezuelan respondents are the least. Surprisingly, just three countries (Iran, Greece, and Turkey) rated the lowest price as the most preferred option. The other three countries (Vietnam, Germany, and Venezuela) prefer chocolate

that costs 1.00 Euro.

Finally, consumers from different countries prefer different labels. "Vegan" is the most beneficial label in Germany; however, it seems to be less important in other countries, especially in Greece. "No palm oil" is the most and the second most preferred label in Turkey and Germany, respectively, but is the least preferred label in Venezuela and Vietnam. Venezuelan and Greek respondents rated "organic" as the most preferential label, however, it is significantly less preferred in Vietnam. Vietnamese respondents as well as Iranian respondents preferred "climate friendly" label. "No sugar added" obtained the lowest part-worth utilities in four countries including Iran, Germany, Greece, and Turkey.

3.4. Results of the factor analysis for cultural dimensions

Table 4 shows the results of the factor analysis, which include Hofstede's items for culture and items used to describe consumers' interests and values.

In Table 4, the extracted factors and their arithmetic mean, standard deviation and factor loadings are presented for each item, including: 'power distance', 'uncertainty avoidance', 'collectivism', 'long-term orientation', 'masculinity', 'personal health responsibility', 'environmental consciousness', 'conspicuousness and prestige value', 'quality aspects/consciousness', and 'patriotism'. The Cronbach's Alpha criterion was utilized to measure internal consistency. To guarantee an exact measurement, factor loadings need to have the same direction, and so the item "I don't worry about my health, until I get sick" was surveyed as "I only worry about my health when I get sick.". In the existing factor analysis, Cronbach's Alpha values were located from 0.522 to 0.861. As recommended by Nunally (1978) and [100], values should not fall below 0.6; in our study, only the factor environmental consciousness (0.522) fell below this.

Next, the consumers from each country will be described using the extracted factors of Table 4. The mean values for each factor in each country are presented in Table 5.

Vietnamese consumers can be characterized by the highest mean values for masculinity, conspicuousness and prestige value, and uncertainty avoidance. Furthermore, they had the second highest mean values for patriotism, and long-term orientation. Interestingly, although the majority of Vietnamese respondents are female, the result shows that Vietnam has a dominant male sex role pattern. The roles of men and women in their society are clearly distinct. Additionally, they tend to feel more threatened by unknown situations and prefer explicit rules. They act for long-term goals rather than short-term goals. Moreover, they have a strong attachment to their country. In addition, compared to consumers from other countries, they are more likely to buy products for prestige reasons. Nevertheless, Vietnamese consumers had the lowest mean value for environmental consciousness. Interestingly, in this survey, they show a great preference for non-packaged products and "climate-friendly" label.

Like Vietnamese culture, Iranian culture also showed high mean values for masculinity and uncertainty avoidance. On the other hand, Iranian people are more focused on the short term as they had the lowest mean values for long-term orientation. In terms of individual interests and values, they had relatively high mean value for conspicuousness and prestige value, but low mean values for environmental consciousness and patriotism. These findings can, to some extent, explain why Iranian prefer imported products to local ones.

German consumers demonstrated the highest mean values for long-term orientation, personal health responsibility and environmental consciousness. Long-term goals are more important to them than short-term goals. It is logical to assume that as a result, they are more aware of their responsibility for their own health and the environment. On the other hand, they had the lowest mean values for power distance, collectivism, and patriotism. They prefer flat hierarchy, prioritize their personal interests over the welfare of the group, and do not feel particularly committed to their own country. Furthermore, they are

Table 4
Results of the factor analysis (N = 412).

Factors and the Corresponding Items	Mean	SD	Factor Loading
PO Power distance[a] (Cronbach's alpha: .649) (1)			
PO1 People in higher positions should make most decisions without consulting people in lower positions.	2.06	1.050	0.630
PO2 People in higher positions should not ask the opinions of people in lower positions too frequently.	1.99	1.030	0.617
PO3 People in higher positions should avoid social interaction with people in lower positions.	1.68	0.973	0.723
PO4 People in lower positions should not disagree with decisions by people in higher positions.	1.96	0.998	–
PO5 People in higher positions should not delegate important tasks to people in lower positions.	2.19	1.065	0.668
UN Uncertainty avoidance[a] (Cronbach's alpha: .796) (1)			
UN1 It is important to have instructions spelled out in detail so that I always know what I'm expected to do.	4.10	0.932	0.722
UN2 It is important to closely follow instructions and procedures.	3.96	0.823	0.679
UN3 Rules and regulations are important because they inform me of what is expected of me.	3.98	0.859	0.782
UN4 Standardized work procedures are helpful.	3.85	0.919	0.639
UN5 Instructions for operations are important.	4.24	0.707	0.776
CO Collectivism[a] (Cronbach's alpha: .801) (1)			
CO1 Individuals should sacrifice self-interest for the group.	2.92	1.034	0.734
CO2 Individuals should stick with the group even through difficulties.	3.63	1.012	0.626
CO3 Group welfare is more important than individual rewards.	3.40	1.010	0.771
CO4 Group success is more important than individual success.	3.36	1.041	0.760
CO5 Individuals should only pursue their goals after considering the welfare of the group.	2.95	1.061	0.666
CO6 Group loyalty should be encouraged even if individual goals suffer.	3.01	1.027	0.663
LT Long-term orientation[a] (Cronbach's alpha: .654) (1)			
LT1 It is important to spend money very carefully (Thrift).	3.72	0.911	–
LT2 It is important to keep going with determination in spite of opposition (Persistence).	4.01	0.869	0.600
LT3 Personal steadiness and stability is a good quality for a long term goal.	4.29	0.707	0.672
LT4 Long-term planning is a necessity when it comes along term goal.	4.05	0.794	0.647
LT5 Giving up today's fun for success in the future is more important.	2.87	1.083	0.550
LT6 Working hard now is important for success in the future.	3.90	0.906	0.649
MA Masculinity[a] (Cronbach's alpha: .778) (1)			
MA1 It is more important for men to have a professional career than it is for women.	1.93	1.124	0.729
MA2 Men usually solve problems with logical analysis; women usually solve problems with intuition.	2.19	1.090	0.747
MA3 Solving difficult problems usually requires an active, forcible approach, which is typical of men.	1.76	0.965	0.760
MA4 There are some jobs that a man can always do better than a woman.	2.62	1.350	0.753
PHR Personal health responsibility[b] (Cronbach's alpha: .676) (2)			
PHR1 I notice how I feel physically as I go through the day.	3.80	0.882	0.673
PHR2 I take responsibility for the state of my health.	4.06	0.826	0.773
PHR3 Good health takes active participation on my part.	4.13	0.824	0.792
EC Environmental consciousness[c] (Cronbach's alpha: .522) (2)			

(continued on next page)

Table 4 (*continued*)

Factors and the Corresponding Items	Mean	SD	Factor Loading
EC1 It is still true that politicians do not do enough to protect the environment.	4.24	0.903	0.594
EC2 In favor of the environment, we should all be willing to reduce our current standard of living.	3.43	1.150	0.693
EC3 Environmental protection measures should also be enforced when jobs are lost as a result.	3.47	1.030	0.742
CPV Conspicuousness and prestige value[d] (Cronbach's alpha: .842) (2)			
CPV1 I like to know what luxury brands and products make good impressions on others.	3.08	1.223	0.786
CPV2 To me, my friends' perceptions of different luxury brands or products are important.	2.76	1.136	0.805
CPV3 I pay attention to what types of people buy certain luxury brands or products.	2.86	1.182	0.726
CPV4 It is important to know what others think of people who use certain luxury brands or products.	2.76	1.153	0.825
CPV5 I am interested in determining what luxury brands I should buy to make good impressions on others.	2.36	1.139	0.753
QA Quality aspects/consciousness[e] (Cronbach's alpha: .770) (2)			
QA1 For me, the naturalness of the food is an important factor.	3.84	0.938	0.686
QA2 I prefer fresh products over canned products.	4.17	0.930	0.516
QA3 I would like to pay more money for animal welfare approved meat and eggs.	3.50	1.147	–
QA4 I prefer to buy food from my region.	3.78	0.921	0.695
QA5 I like to buy foods that have been hand-crafted production.	3.65	0.961	0.668
QA6 I prefer to buy foods that were traditionally made.	3.53	0.942	0.676
QA7 I prefer food with a trustworthy character (for example, organic, Fairtrade, animal welfare) to foods without a label.	3.82	0.947	0.617
PT Patriotism[f] (Cronbach's alpha: .861) (2)			
PT1 I love my country.	3.82	1.131	0.834
PT2 I am proud to be from my country.	3.64	1.163	0.814
PT3 In a sense, I am emotionally attached to my country and emotionally affected by its actions.	3.75	1.088	0.758
PT4 Although at times I may not agree with the government, my commitment to my country always remains strong.	3.46	1.204	0.821
PT5 When I see my country do well in events like the Olympics, I feel great.	3.85	1.159	0.707

Note. Extraction method: Principal component analysis. Rotation method: Varimax with Kaiser normalization. Scale from 1 'totally disagree' to 5 'totally agree'. N = 412. (1) Kaiser-Meyer-Olkin measure of sampling adequacy is average (KMO = 0.788), Bartlett's test of sphericity is significant (approximate Chi-Square = 2,714,552, df = 325, significance according to Bartlett = 0.000), items with factorloading<0.5 are excluded. (2) Kaiser-Meyer-Olkin measure of sampling adequacy is average (KMO = 0.795), Bartlett's test of sphericity is significant (approximate Chi-Square = 2,918,671, df = 253, significance according to Bartlett = 0.000), items with factorloading<0.5 are excluded.

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adaptable to changes as they had low mean values for uncertainty avoidance. They also had low conspicuousness and prestige value. They buy and consume things for their own benefit rather than to impress other people.

Greek culture can be characterized by the highest mean value for collectivism and the lowest mean value for uncertainty avoidance. The ties between individuals in their society are strong and they do not feel intimidated in unfamiliar situations. In terms of individual interests and values, they had the lowest mean value for conspicuousness and prestige value and the highest mean value for quality aspects/consciousness. It implies that in the view of Greek consumers, the quality of a product is more important than its ability to impress others.

Turkish consumers stood out with the highest mean value for power distance. They are inclined to accept and expect unequal distribution of power in society. Nonetheless, they had the lowest mean value for masculinity and the second lowest mean value for long-term orientation. They permit greater overlapping in the social gender roles and are more short-term oriented. In terms of individual interests and values, they had high mean values for conspicuousness and prestige value, patriotism, and environmental consciousness. On the other hand, they had low mean values for personal health responsibility and quality consciousness. This suggests that they may be more influenced by a product's social values than its health effects.

Venezuelan culture demonstrated low mean values for power distance and collectivism. They are rather individualistic and expect power to be distributed equally. Yet, consumers from Venezuela can be characterized by the highest mean value for patriotism. This is, however, not surprising because in the previous analysis, they had significantly higher preference for local chocolate, compared to other countries. Furthermore, whereas environmental consciousness, conspicuousness and prestige value, and quality aspects/consciousness were rated with medium scores, they had a relatively high mean value for personal health responsibility. This suggests that health-related information on the products may have a stronger influence on their purchases.

Fig. 7 illustrates the mean values for the six countries in a radar chart for better profile comparison.

3.5. Regression analysis

First, "local", an attribute level of origin of the company, was chosen as dependent variable. Independent variables for this model include "age", "patriotism" and "quality aspects/consciousness". The corrected R^2 is 0.070. The influence of patriotism on local chocolate is unsurprisingly the most significant value (sig. <0.001). On the other hand, the results show that age affects purchases of local chocolate negatively, with a significants of 0.003.

Second, raw chocolate was set as dependent variable. At the same time, "age", "masculinity", "quality aspect/consciousness", and "conspicuousness and prestige value" were chosen as the predictors. This model results in a corrected R^2 of 0.151. It shows that the preference for raw chocolate increases with age (sig. <0.001). Moreover, purchase of raw chocolate can also suggest higher individual value for conspicuousness (sig. = 0.008).

Next, the relationship of white chocolate and "age", "power distance", "quality aspect/consciousness", "patriotism", "conspicuousness and prestige value", "personal health responsibility", and "collectivism" was analyzed. The corrected R^2 for this model was 0.149. The most influential factor is age. In contrast to raw chocolate, white chocolate is more preferred by younger consumers.

The price of 2.50 Euro was then analyzed in relation to "age", "power distance", "uncertainty avoidance", "long-term orientation", "quality aspect/consciousness", "conspicuousness and prestige value", "personal health responsibility" and "environmental consciousness". Four factors that positively influence consumers' willingness to pay the high price are "personal health responsibility", "long-term orientation", "quality aspect/consciousness", and "age".

Table 5
Profiling the subsamples. Values represent mean factor scores of the extracted factors for each subsample (N = 412).

Factors	Subsample Factor Means					
	Vietnam (11.7 %)	Iran (15.7 %)	Germany (14.8 %)	Greece (14.3 %)	Turkey (32.3 %)	Venezuela (11.2 %)
PO Power distance	$0.110^{c,d}$	$-0.138^{b,c}$	-0.632^{a}	$-0.249^{a,b}$	0.568^{d}	$-0.440^{a,b}$
UN Uncertainty avoidance	0.219^{c}	$0.182^{b,c}$	$-0.325^{a,b}$	-0.358^{a}	$0.140^{a,b,c}$	$0.024^{a,b,c}$
CO Collectivism	-0.025^{a}	-0.036^{a}	-0.247^{a}	0.507^{b}	$-0.015^{a,b}$	-0.230^{a}
LT Long-term orientation	$0.253^{a,b}$	-0.263^{a}	0.346^{b}	$0.172^{a,b}$	-0.231^{a}	$0.108^{a,b}$
MA Masculinity	0.671^{c}	$0.395^{b,c}$	$0.042^{a,b}$	-0.336^{a}	-0.353^{a}	$0.237^{b,c}$
PHR Personal health responsibility	$-0.014^{a,b}$	$-0.047^{a,b}$	0.449^{b}	$-0.021^{a,b}$	-0.223^{a}	$0.179^{a,b}$
EC Environmental consciousness	-0.302^{a}	-0.258^{a}	0.311^{b}	$-0.093^{a,b}$	$0.100^{a,b}$	$0.073^{a,b}$
CPV Conspicuousness and prestige value	0.571^{d}	$0.128^{c,d}$	$-0.488^{a,b}$	-0.590^{a}	$0.214^{c,d}$	$0.007^{b,c}$
QA Quality aspects/consciousness	-0.063^{a}	0.029^{a}	0.097^{a}	0.201^{a}	-0.109^{a}	-0.038^{a}
PT Patriotism	0.345^{b}	-0.470^{a}	-0.596^{a}	0.158^{b}	0.180^{b}	0.393^{b}

Note. Items were assessed by means of Likert scales (1 = totally disagree; 5 = totally agree). Superscripts stand for significant mean differences at the 0.05 level based on Tukey testing.

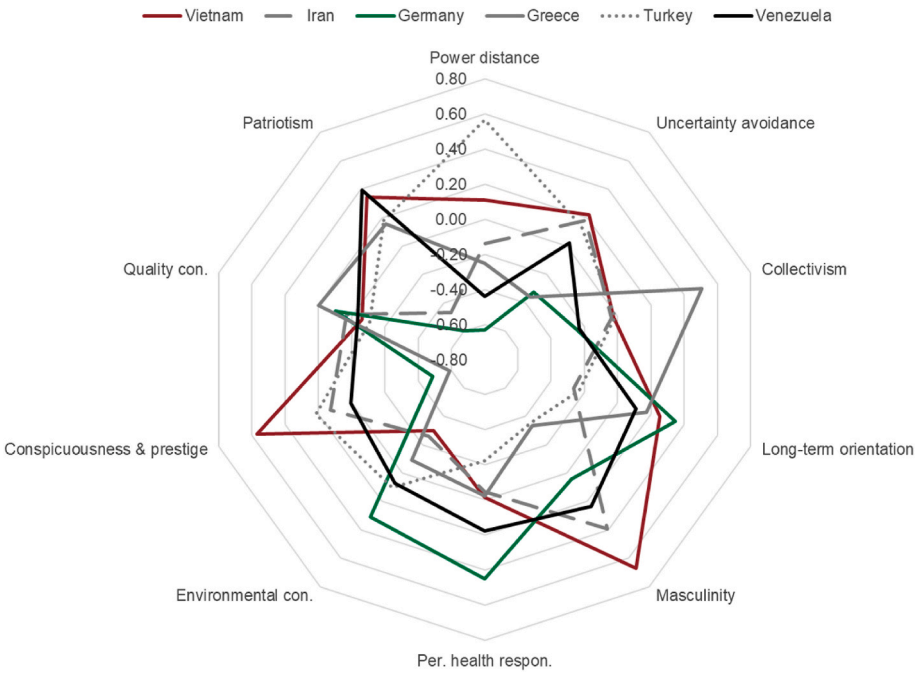

Fig. 7. Profiling the subsamples. Values represent mean factor scores of the extracted factors for each subsample.

Consumer preferences for labels seem to be diverse and more difficult to identify using our design. Only the "climate friendly" label has some interesting results. The relationship between "climate friendly" and the predictors: "collectivism", "uncertainty avoidance", "masculinity", "power distance", "environmental consciousness" and "age" has a corrected R^2 of 0.092. Older consumers, consumers of more masculine society, and consumers with low environmental consciousness have a significant preference for "climate friendly" label (sig. = 0.009; sig. = 0.011; sig. = 0.030, respectively).

4. Discussion

The findings support prior research suggesting that taste is the primary factor influencing chocolate purchase and consumption [60,62]. In this study, respondents, regardless of their nationalities, pay the most attention to type and flavor, the two attributes that directly inform them about what taste they should expect. According to Massaglia et al. [67], the dominant reason consumers choose a certain chocolate type is to match their taste preferences. They further noted that because cocoa content is an important determinant of chocolate health effects, health-conscious consumers use this information to make healthier choices – namely choosing extra-dark chocolate. From a cross-cultural perspective, our study cannot provide any significant correlation between personal health responsibility and chocolate with high cocoa content. Indeed, we found that despite their strong personal health responsibility, German respondents preferred chocolate with low cocoa content. This indicates that hedonistic value plays an important role in chocolate consumption. The majority of consumers might not be willing to make a tradeoff between taste and health, especially when it comes to choosing an indulgent treat like chocolate [62]. Although taste preferences are subjective [62], we observed that Vietnamese, Iranian, and Venezuelan respondents generally prefer darker chocolate types, while German, Turkish, and Greek respondents prefer sweeter types. It could conceivably be hypothesized that there are cross-national differences in individual acceptance of bitterness and sweetness. Furthermore, socio-cultural motives, such as social norms and social image, may also affect consumer choice. For instance, the results of the regression analysis show that conspicuousness and prestige value, as well as quality aspects promote the acceptance of raw chocolate.

Our findings add complexity to the understanding of cross-cultural consumer behavior by highlighting areas where existing literature only partially explains observed preferences. For example, while Sorokowska et al. [39] attributed taste differences to cultural dietary norms and genetic factors, our study reveals that preferences for chocolate

bitterness or sweetness also intersect with symbolic and social values, such as the prestige attached to high-cocoa-content chocolates in Vietnam. Similarly, although Magnier et al. [78] suggested that sustainable packaging enhances perceived product quality, we found that this effect varies significantly; Greek participants strongly favored wooden packaging, suggesting an aesthetic or traditional appeal rather than purely environmental motivations. Additionally, while Thøgersen [25] emphasized that local production fosters ethnocentric purchasing, our findings complicate this narrative by showing that German and Iranian consumers preferred imported chocolates, possibly reflecting perceptions of quality superiority. These divergences underscore the importance of integrating cultural and psychographic constructs, such as quality consciousness and collectivism, to capture the nuanced drivers of sustainable and health-oriented food choices across contexts.

Price, origin of the company, label, and packaging are found to have supplementary roles in chocolate decisions. Interestingly, when comparing consumers from the six countries, they largely differ in the relative importance placed on these attributes. While labels have limited impacts in general, some consumers prioritize packaging, some pay attention to the company's country of origin, and some others are more concerned about the price.

Packaging is an extrinsic attribute of chocolate. Del Prete and Samoggia [62] previously mentioned that packaging is relevant in chocolate purchase because chocolate is often bought as a gift. According to Bou-Mitri et al. [79], packaging significantly influences consumers' perception in terms of food quality, safety, healthiness, and preference to buy. Furthermore, Bock and Meyerding [80] observed that consumers use packaging material as a key assessment of product sustainability value. In a study conducted by Magnier, Schoormans, and Mugge [78], sustainable packaging is found to have a positive influence on product quality perception, especially when intrinsic product sustainability is not communicated to the consumers. However, it is noteworthy that due to lack of knowledge and information about the environmental impacts of different materials, consumers evaluate food packaging based on affective feelings rather than cognitive reasonings [81]. Our findings show that packaging preferences vary across countries and cultures. While paper is preferred in Vietnam, Germany and Turkey, metal is preferred in Iran and Venezuela, and wood is preferred in Greece. Interestingly, respondents mutually show low preferences for plastic. A possible explanation might be that respondents view plastic as unsustainable [80].

Comparing the two credence attributes included in our study, we found that the company's country of origin is more important than label in chocolate choice, which is contrary to prior research suggesting that origin may become less relevant if there are other quality labels presented on the products [25]. This could be attributed to the strong associations of place and chocolate quality formed over the history of chocolate production [82]. In line with our expectation, Swiss and Italian chocolates are confirmed to have gained good reputation globally. The USA, on the other hand, is less well perceived by the consumers despite being the biggest chocolate producer [83]. One interesting finding is that Japanese chocolate is significantly more popular in Vietnam than in the other five countries. This could be due to the availability of Japanese products in Vietnam's market and the positive country image perceived by the consumers [84,85]. Besides being a quality cue, origin information can convey the feelings of ethnocentrism and patriotic duty; consumers may therefore feel responsible to support their domestic industry [25]. According to Thøgersen [25], domestic products are generally preferred over imported ones. In line with his observation, the findings show that four of the six countries rated local chocolate with the highest part-worth utility. Furthermore, the findings provide strong evidence for the correlation between patriotism and the utility of local chocolate. On the other hand, we observed that Iranian consumers prefer imported to domestic chocolate and that German consumers prefer Swiss to local chocolate. As mentioned earlier by Thøgersen [25], a lower preference for domestic products compared to imports from a more developed country can be found in developing countries, this is expected in the case of Iran. In addition, according to our country profiling, Germany and Iran have the lowest mean values for patriotism. This suggests that patriotic duty and ethnocentrism are not the main drives of buying local products of consumers from these countries. In the case of Germany, consumers choosing local chocolate may be because German chocolate producers have successfully convinced consumers with their quality, food safety and sustainability values.

Labels are seen as a useful tool to help consumers make healthier and more sustainable choices [86]. Yet their effects may differ considerably depending on individual, contextual, and label characteristic variables [86]. Our findings reveal that consumers from different countries have interest in different labels. According to the country profiling test, German respondents are found to have the highest personal health responsibility and environmental consciousness, we assume that they also have more related knowledge. In line with scientific recommendations, they preferred specific labels rather than non-specific ones [87]. Significantly, "vegan" label is more beneficial for German respondents than respondents from the other five countries. This possibly reflects their awareness of the benefits of plant-based substitutes [10] and the growing number of people adopting vegan diets within the German population [88,89]. Another interesting finding is that Vietnamese and Iranian consumers, who are less environmentally conscious, show higher preferences for "climate friendly" label. This suggests that "climate friendly" label has communicated sustainability value to these consumers more successfully. Nonetheless, we found that "no sugar added" label gained low part-worth utilities. This is consistent with previous research suggesting that sugar free chocolate is perceived as less tasty and thus less preferred than sugar-containing chocolate [63].

Price is a basic element of any purchase. We identified that the importance of price varies across countries, yet it gained the third place at most. Overall, lower prices obtained higher utilities among consumers [63,90]. However, we also found that the lowest price is not the most preferential option in all six countries. It can be expected that consumers use price to evaluate product quality [91]. Furthermore, it should be taken into account that food price environments are different between countries. According to the regression analysis, consumers who are concerned about health and quality as well as long-term oriented, are more willing to pay a high price for their desired products.

Nevertheless, the ideal products of different countries resulted from this survey suggest that consumers consider taste to be the most important requirement in their choice. Attributes that provide environmental sustainability values, including local production, sustainability labels and sustainable food packaging positively improve product preferences. Health value is on the other hand less important in chocolate choice.

According to Marchi et al. [16], consumer preferences for sustainability-related attributes are correlated with environmental knowledge. Hartmann et al. [11] demonstrated that knowledge improves consumer ability to identify sustainable products. According to Cavaliere, De Marchi and Banterle [92], knowledge helps consumers understand labels and selectively pay attention to relevant features to reduce information overload. Furthermore, pro-environmental behaviors are encouraged by knowledge about food sustainability (Ran et al., 2022; [16]). On the other hand, Otto et al. [81] found that if consumers lack sufficient knowledge, they might rate product sustainability based on subjective feelings rather than rational thinking; and as a result, their choices are often less sustainable than intended. In the present study knowledge was not considered but could be an important factor explaining product choice, particularly when it comes to the preferences for more sustainable options. Therefore, future research should incorporate a quiz into the questionnaire, measuring knowledge and understanding regarding environmental issues.

The findings of this study have implications for theory, practice, and policy, particularly in understanding the interplay between cultural

values and food preferences. The observed cultural differences in chocolate preferences—such as the Vietnamese preference for non-packaged chocolates or the German emphasis on milk chocolate despite high environmental and health consciousness—highlight the role of cultural frameworks like Hofstede's dimensions [44] in shaping consumption patterns. These findings extend theoretical perspectives by emphasizing the mediating role of socio-cultural constructs, such as collectivism and power distance, on decision-making processes in cross-cultural contexts. For instance, the strong preference for locally produced chocolate in Venezuela aligns with high patriotism levels, reflecting an interplay between cultural identity and food consumption [36].

From a practical standpoint, these results underscore the need for culturally tailored marketing strategies that consider both universal drivers, such as taste, and context-specific preferences, such as packaging materials and labeling. For example, in countries like Vietnam, where non-packaged or minimally packaged products resonate with consumers, marketers could highlight artisanal qualities while minimizing environmental impact through innovative designs. Conversely, in Germany, emphasizing product quality and ethical certifications could address consumer concerns more effectively.

Policy implications are equally significant, especially concerning sustainable consumption. Governments and organizations can leverage these insights to design culturally sensitive interventions that promote sustainable and health-conscious food choices. For instance, campaigns in Iran might focus on reducing price barriers for sustainable chocolates, reflecting the heightened price sensitivity observed among Iranian consumers, while those in Greece could target aesthetic and functional packaging preferences to improve engagement. Furthermore, education initiatives could be tailored to increase environmental awareness in regions with lower sustainability consciousness, such as Vietnam, thereby enhancing the impact of sustainability-related labels [11,16].

The observed differences in food preferences across cultures also suggest underlying socio-economic, historical, and market factors that warrant further exploration. For instance, the higher preference for Swiss and Italian chocolates in Germany and Iran could stem from long-established reputations for quality associated with these origins [82]. Similarly, the favoring of wooden packaging in Greece might reflect a cultural alignment with traditional and rustic aesthetics, distinct from the more industrialized packaging preferences in countries like Iran. These variations underline the importance of contextualizing cultural preferences within historical and socio-economic frameworks, expanding the scope of existing cross-cultural food choice research.

There are limitations that should be addressed for this study. First, the analysis has a limited quantity of respondents, and the respondents are recruited just from authors' connections and only focused on young consumers. Therefore, the results may not be representative for the whole country or generation. Further research could conduct a survey on a larger scale and focus on different age range or generations for better understanding of the cultural impacts on consumer preference. Second, respondents might underestimate economic factors in online surveys. Third, there are limitations in the survey design. In this survey, cultural values are not optimal to predict consumer preferences for food. Future research could develop a more detailed scale to profile cultural values and food-related behavior of consumers to gain better understanding. As the combination of chocolate type and flavor can positively or negatively influence the overall taste [93], this may influence the preference for certain product combinations. Furthermore, brands have been identified as an important factor influencing chocolate purchases [63,68]; however, it is not included in the current study. Another limitation of this study is its focus on a single food category—chocolate. While this choice allowed us to delve deeply into cultural perceptions specific to this product, the findings may not fully represent consumer behaviors across diverse food categories. Future research should include a broader array of food products, such as savory snacks or beverages, to explore the cultural nuances in food choice behaviors comprehensively. Expanding the range of products would enhance the generalizability of the findings and provide a more holistic view of cultural influences.

Despite the robust design and comprehensive analysis of this study, several limitations must be acknowledged, particularly concerning potential sources of bias inherent in cross-cultural research. The study's sample was recruited through social media platforms, which may not be representative of the broader population. This method could lead to a sampling bias, as it might attract participants with specific socio-demographic characteristics, such as younger, more tech-savvy individuals. To mitigate this, we ensured a diverse sample by targeting various social media groups and networks across different countries. However, future research should consider using more varied recruitment methods to enhance representativeness [94]. Given the self-reported nature of the survey, there is a risk of response bias, where participants might provide socially desirable answers rather than truthful responses. This is particularly relevant in cross-cultural studies where social norms and desirability can vary significantly. To address this, we assured participants of their anonymity and confidentiality, encouraging honest and accurate responses [95]. The translation of the survey into different languages might introduce cultural bias, as certain concepts and terms may not have direct equivalents in other languages. This could affect how questions are understood and answered. We mitigated this by employing native speakers for translation and back-translation processes to ensure accuracy and cultural relevance [96]. The use of self-reported measures for psychographic constructs and cultural dimensions can be subject to measurement bias. Participants' interpretations of the scales might differ based on their cultural backgrounds. To reduce this bias, we used well-validated scales and conducted pre-tests to ensure clarity and appropriateness of the items across different cultures [96,97]. The cross-sectional nature of the study limits the ability to draw causal inferences. While we identified associations between cultural values and food preferences, we cannot establish causality. Longitudinal studies are recommended for future research to better understand the causal relationships [98]. The study focused on young consumers under 35 years old, which may limit the generalizability of the findings to older populations. Future research should include a broader age range to enhance the applicability of the results to the general population [99].

To build on the findings of this study and address the complexities of cross-cultural food preferences, future research could explore several specific questions and hypotheses. These directions will provide deeper insights into the interplay between cultural values, socio-economic factors, and sustainable food choices, further enriching the field of cross-cultural food studies. One potential research question is: How do cultural dimensions such as collectivism and individualism influence the effectiveness of sustainability labels on food products? The hypothesis here is that in collectivist cultures, sustainability labels that emphasize community and environmental benefits (e.g., supports local farmers) will be more effective than those that emphasize individual benefits (e.g., healthier choice). Another important question is: What role does gender play in the preference for sustainable food packaging across different cultures? We hypothesize that women are more likely than men to prefer sustainable packaging options, and this preference is moderated by cultural attitudes towards gender roles. Exploring the impact of environmental knowledge, a relevant research question could be: How does the level of environmental knowledge impact the relationship between cultural values and food choice preferences? The hypothesis is that higher levels of environmental knowledge will strengthen the positive relationship between environmental consciousness and the preference for sustainably labeled food products. Economic factors also play a crucial role in food preferences. A pertinent research question is: How do economic factors such as income and education level influence the prioritization of health versus taste in food choices across different cultures? The hypothesis is that higher income and education levels are associated with a greater emphasis on health over taste in food choices, and this relationship varies by cultural context.

Marketing strategies that highlight cultural heritage can be examined with the question: What is the effect of marketing strategies that highlight cultural heritage on the acceptance of sustainable food products? The hypothesis is that marketing strategies emphasizing cultural heritage and traditional values will be more effective in promoting sustainable food products in cultures with high uncertainty avoidance. Finally, the influence of cultural attitudes towards indulgence and restraint can be explored with the question: How do cultural attitudes towards indulgence and restraint influence the consumption of indulgent yet sustainable food products like chocolate? The hypothesis is that in cultures with high indulgence, consumers are more likely to choose indulgent sustainable food products, whereas in cultures with high restraint, the focus will be more on the health and sustainability aspects. By addressing these research questions and hypotheses, future studies can provide a more nuanced understanding of the factors influencing cross-cultural food preferences and contribute to the development of targeted marketing strategies that align with cultural values and sustainability goals.

5. Conclusion

This study provides empirical evidence of cultural differences in consumer food choice preferences, particularly in the context of chocolate consumption. Our findings highlight that taste is the most influential factor in chocolate choice across all surveyed countries, with healthfulness playing a lesser role. The type of chocolate, which significantly determines both taste and healthiness, underscores that consumers are generally unwilling to trade off taste for health when selecting an indulgent treat.

The study also reveals that sustainable product characteristics, such as packaging and labels, are positively perceived by consumers. Packaging, in particular, serves as an effective medium to communicate sustainability values and enhance product quality perceptions. However, preferences for packaging materials and labels vary significantly across different cultures, indicating the importance of tailoring marketing strategies to specific cultural contexts. Additionally, the research underscores the role of ethnocentrism and social values in food choices. Attributes like the company's origin and prestige value influence consumer preferences, suggesting that local production and perceived quality assurance are critical factors in certain markets. The practical implications of this study suggest that while taste remains a primary driver, marketers can leverage sustainable packaging and appropriate labeling to enhance consumer perception and preference. Future research should consider expanding the sample size and demographic diversity to further validate these findings and explore the impact of additional factors such as brand influence.

In summary, this study contributes to the understanding of cross-cultural food preferences and offers insights for developing targeted marketing strategies that align with cultural values and sustainability goals.

CRediT authorship contribution statement

Stephan G.H. Meyerding: Writing – review & editing, Visualization, Validation, Supervision, Software, Resources, Project administration, Methodology, Investigation, Formal analysis, Conceptualization. **Bao Hanh Trinh:** Writing – original draft, Validation, Formal analysis, Data curation.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

Data will be made available on request.

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