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ORIGINAL RESEARCH ARTICLE

Consumer preference for sustainability labels in the context of China

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ABSTRACT

Sustainability Label (SL) have emerged as an important product attribute in recent decades, and have evolved into various types as products with social, environmental, and economic benefits have become more prevalent in the marketplace. With the information of SL in products, consumers are encouraged to embrace environmental sustainability principles and to make environmentally sustainable choices and actions. SL helps alignment between consumers and the industry by enhancing consumers' understanding of company's act, and serve as an effective marketing message. However, there is limited research on consumer preferences for different types of sustainable labels or benefits. This study addresses this knowledge gap by applying choice experiment method to assess consumers' choice behavior for products associated with various SL. Choice experiment designs are separately developed for two most relevant sustainable products (i.e. soymilk and EV) in China. A stated preference method (SPM) consumer survey was conducted in 2022 across six major cities in China, namely Beijing, Shanghai, Guangzhou, Shenzhen, Chengdu, and Xi'an, and a total of 840 valid responses were collected for assessing multinomial logit (MNL) model. Findings show that Chinese consumers prefer SL with environmental benefits, foreign COO/Brand in consuming soymilk, and prefer SL with employee friendliness, domestic COO/Brand for Electric Vehicle (EV). These findings provide insights for marketers and researchers Chinese consumers' preference for specific SL and brand for two selected product categories.

Keywords: sustainability label; stated preference method; organic foods; electric vehicle; consumer preference; sustainable consumption

1. Introduction

Environmental challenges are increasingly posing a threat to our planet, driven by population growth and the commodification of human activities in modern and urbanized lifestyles. This exploitation of resources leads to adverse effects like global pollution, heightened carbon emissions, deforestation, food and water insecurity[1]. In response to these challenges, consumers are becoming more environmentally conscious and willing to take action to mitigate environmental problems by altering their consumption and lifestyle choices. This trend has been further amplified since the COVID-19 pandemic, where social well-being and resource efficiency have become more important in the context of the social crisis[2-4].

Sustainable consumption has gained significant attention globally and is recognized as a critical component for economic growth, environmental protection, and social inclusion[5]. Consumers are adopting various sustainable consumption practices, such as conscious waste-to-value ratios in food consumption[6],

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choosing plant-based meat alternatives for health and ecological reasons[7], and purchasing recycled and upcycled fashion products[8].

As consumers become increasingly aware of the importance of sustainable consumption, companies are responding by providing sustainable labels on their products. Sustainable labels have emerged as an important product attribute in recent decades, and have evolved into various types as products with social, environmental, and economic benefits have become more prevalent in the marketplace. These labels may address different aspects of sustainability, such as ecological, economic, and social benefits, and may differ in their underlying basis, target groups, informative value, certifying and monitoring systems, and hence their credibility[9].

Sustainability Label (SL) serves as a marketing technique that enable companies to inform consumer about their actions to protect the environment. Companies use environmental labels such as "eco-friendly", "environmentally safe", "recyclable", "biodegradable" and "ozone-friendly"[10] to indicate the environmental benefits of their products. These labels can play a key role in motivating consumers to engage in sustainable consumption practices[11]. Consumers have been shown to respond positively to SL and exhibit a willingness to pay a premium for products with such label[12-14]. With the information of SL in products, consumers are encouraged to embrace environmental sustainability principles and to make environmentally sustainable choices and actions[15]. Thus, SL also helps alignment between consumers and the industry by enhancing consumers' understanding of company's act, and serve as an effective marketing message[16].

However, there is limited research on consumer preferences for different types of sustainable labels or benefits. Consumers may value different aspects of sustainability labels, and company need to understand which aspects of sustainable benefits are most valued by consumers in a consumption situation. This information is crucial for companies to develop effective product development, marketing strategies, and consumer communication. The purpose of this study is to assess consumers' choice behavior for products with SL using choice experiment method. The rest of this paper is organized as follows. Section 2 reviews the literature on sustainability labels, country of origin, price sensitivity towards sustainable products. Section 3 presents the conceptual framework, while section 4 describes research method and data collection. Section 5 shows results and discussion, and finally section 6 presents theoretical and practical implications of this study.

2. Literature review

2.1. Sustainable labels

In recent years, an increasing number of scholars have contributed to understanding of sustainability labels by examining the influence of consumers' values and attitudes (see **Table 1**). Despite the importance of SL as an extrinsic cue for consumers' choice behavior, studies on consumers' response towards SL have shown mixed results. From previous studies, several important findings have emerged. First, consumers in many countries have demonstrated a mixed level of understanding of SL. This may be due to different definitions of SL depending on its contents, regulatory measures, systems, and communication approaches which are applied in different markets. Inconsistency in existing SL can result in confusion of consumers' perceptions, and confused consumer may not fully recognized the value of SL which can lead to little or no response to such labels[17,18]. Studies also show that consumers' knowledge of SL can play an important role in their sustainable product choices. Second, consumers' trust in SL, which is influenced by external conditions such as government regulation, communication efficiency in the market place, were found to be varying across countries. For example, consumers in France and China have shown distrust in SL[19,20], while consumers in Italy and Poland have shown a high level of trust in SL such as certified organic food products[21]. Third, consumers' intrinsic values, attitudes and personal traits, such as environmental concerns and altruism, were

found to have an impact on their response to SL, thus consumers in different countries with different culture, norms and values are likely to have different attitude towards sustainability and SL.

Table 1. Summary of research on sustainability labels (SL).

Authors	Journal	Country	Method	Findings
Janßen and Langen[22]	Journal of Cleaner Production	Germany	Choice experiment	Identification of three consumer segments: 'price-sensitive'; 'willing to pay premium for SL; and 'consider both price and SL'
Cho and Baskin [23]	Journal of Business Research	the United States	Between-subjects experiment	Consumers' choice of food products with SL for health benefits.
Cho and Berry [24]	Journal of Business Research	the United States	Schema congruity theory	Consumers with higher social desirability, that is, those who generally want to be perceived as responsible and admirable individuals, tend to pay more attention to SL.
Liu et al.[19]	Food Policy	China	Choice experiment	Chinese consumers' willingness to pay for traceable food is differentiated by their trust in government's supervision of food safety and food labels.
Ding and Veeman[25]	Agribusiness	China	Choice experiment	Chinese consumers are affected by branding and quality certification labels when it comes to fresh milk purchase.
Annunziata, et al. [17]	Sustainable Production and Consumption	Italy	Choice experiment	The level of visibility and understanding of SL such as 'Rainforest Alliance certification' and 'Libera Terra' is low in Italy. Visibility and understanding of SL are significant factors for consumer choice behavior.
Gao, et al. [18]	China Economic Review	China	Contingent valuation	Lack of understanding on SL by Chinese consumers, while premium (40%) is attached to SL milk.
Herbes, et al. [20]	International Journal of Consumer Studies	Germany, France and the United States	Cue utilization theory	SL on packaging is a determinant for U.S. and German consumers' purchasing behavior, while physical appearance of product is important for French consumers.
Chen et al. [26]	International Journal of Consumer Studies	the United States	Contingent valuation method	Product quality and SL are found to be important for consumer valuation of products, and difference in SL (i.e. organic and local) can affect their choice.
Murphy et al. [21]	Food Control	Italy and Poland, UK and Germany	Cross-sectional survey	A high level of trust in certified organic food chain and produce, and perceived benefits of certification bodies; with country differences among Italy and Poland, UK and Germany.
Aprile and Punzo [27]	Journal of Cleaner Production	Italy	Choice experiment	Validation of relationship between knowledge and SL.
Siraj et al. [28]	Business Strategy and The Environment	China	Theory of planned behavior	Perceived behavioral control of SL is a major driver for consumers' choice behavior.
Singh et al. [29]	International Journal of Consumer Studies	China	Structural equational modelling	Consumers' trust in SL is a mediating construct for the relationship between antecedents (environmental concerns andeco-label awareness) and their willingness to pay for SL food products.
Sigurdsson et al. [3]	Journal of Business Research	the United States	Between-within subjects design	SL on fish fillets is associated with customer-based label equity (familiarity, understanding, trust).

Table 1 presents summary of studies on consumers' choice behavior towards SL which applied various determinants, contexts and methodology. In studies using attitude-based modeling, intrinsic consumer attributes such as values, beliefs, attitudes, and knowledge are frequently identified as significant constructs, while social context is found to play a role as a moderator or mediator. This approach emphasizes consumer-related factors as major drivers affecting their choice behavior. Conversely, other studies which applied multi-

attribute choice models focus on product-related factors to explain consumers' behavior of SL choices[17,19,27]. In such studies, the relationship between SL versus trust in product quality factors such as food safety, price, health benefits are examined, and relative importance of SL compared to other product factors are discussed.

Multiple-attribute choice models enable consumers to make trade-off decisions across different product attributes which is more realistic choice scenarios[30]. While the existing literature provides valuable insights into consumers' behavior toward SL with an application of the multi-attribute choice model, research on the effects of various type of SL on consumers' choice behavior remain limited.

2.2. Country of origin and brand

Country of Origin (COO) is one of the most researched constructs in the field of international marketing since the 1980s. COO influences consumers' choice process and behavioral outcomes significantly especially in the context of international markets[31], as consumers often evaluate a product based on their perception of the country in which it is manufactured[32].

As such, COO is considered to be one of the most important extrinsic cues when marketing a product in a foreign country, and consumers tend to associate COO with product quality, and this association can have a positive effect on their perceived brand image[33].

When it is difficult for consumers to evaluate intrinsic quality of a product, consumers were found to use COO image as a surrogate cue for product quality[34]. For instance, US consumers tend to prefer foreign brands when they perceive COO of the foreign brands favorably, regardless of quality judgement[35]. This suggests that perceived COO image can have a greater effect on their choice behavior than perceived quality. On the other hands, some researchers argue that consumers tend to link COO with product quality, and when consumer perceive a strong connection between COO and product quality, COO can have a positive effect on their perceived brand image[36]. To infer the quality of a country's product, consumers may look to the country's image in situations where they cannot detect the true quality before purchasing. Therefore, a positive country image can influence consumers' judgments and attitudes toward a product[37].

In addition, consumers may use brand as a signal for product quality. Consumers characteristics such as their global orientation can also play a role in their choice making process, as consumers with a high level of global orientation may consider the globalness of a brand as a positive quality signal[38]. Other studies report that consumers were found to consider the localness of a brand as a sign of originality and uniqueness[39]. In some emerging markets, foreign brands are preferred by consumers as they perceive foreignness of a brand to be of higher quality[34].

2.3. Price sensitivity

Price sensitivity is defined as the extent to which individuals respond differently to changes in price and price disparities for a particular product or service[40,41]. Price sensitivity is considered to an important concept in the studies of consumers' sustainable consumption, as it is one of the main reasons why consumers opt to withdraw from actual purchase of a sustainable product. Thus, it is used as a direct and indirect determinant of consumers' choice behavior for sustainable products in numerous studies[42]. Consumers who express environmental concerns do not necessarily make an actual purchase of sustainable products for higher price[43]. Several studies applied choice experiments to investigate how consumers evaluate trade-offs between price and sustainable products (see **Table 1**). Kaczorowska et al. [44] show consumers' sensitivity toward price level of a sustainable product in the experiment study. The study reports that 30% of the respondents opted for a cheaper product without SL or switch to a different product when the price of sustainable product increases by 10%, while 50% of the respondents withdraw from a purchase of sustainable product when its price increase

by 20%. Similarly, less price-sensitive consumers are more likely to opt for sustainable products which may cost more[45]. Thus, consumers' price sensitivity may negatively moderate the relationship between consumers' environmental concern and choice for sustainable products. These studies suggest that price sensitivity is one of the most important constructs which may cause disparity between consumer's purchase intention and actual purchase. Thus, consumers with a high price sensitivity may be less likely to integrate their environmental concerns and beliefs into sustainable consumption behavior.

3. Conceptual framework

This paper presents an empirical assessment of consumers' preference for sustainable products by applying data that are collected from China. In order to accommodate the distinctive conditions of Chinese sustainable markets, two particular product categories (i.e. Dairy products and electric vehicles (EVs) are selected with an application of conjoint analysis. We administered a stated preference method (SPM) questionnaire to a sample of Chinese consumers to elicit their preferences for various scenarios of products, taking into account factors such as country of origin, brand, and sustainability attributes, as summarized in Table 2. Highly differentiated nature of the dairy and EV markets in China provide a rich set of product choices for our analysis, enabling us to obtain robust estimates of consumer preferences. This research thus contributes to a better understanding of the drivers of consumer behavior for important sectors of green products in China.

3.1. Stated preference method

The Stated Preference Method (SPM), as proposed by Louviere and Timmermans in 1992, was employed as the foundation for our survey data collection[46]. Through the SPM, we were able to explore relative trade-offs that Chinese consumers make among various choices of their purchasing decisions, as illustrated in **Figure 1**. By analyzing the extent to which consumers consider intrinsic and extrinsic cues in their choices for dairy and EV products, our research can offer valuable insights for marketers seeking to differentiate their sustainable products for the Chinese market.

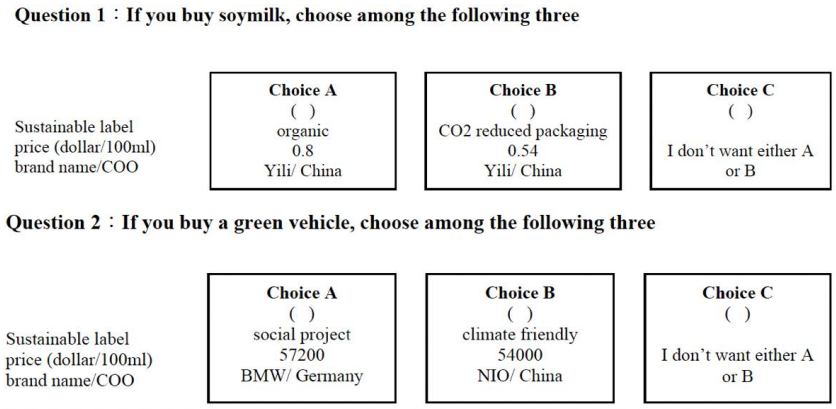

Figure 1. An example of SPM questionnaire.

To develop our SPM survey designs, we conducted preliminary studies and pilot surveys to identify the most salient factors and factor levels. Our analysis identified three primary factors - price, sustainability label (SL), and country of origin (COO)/Brand (as summarized in **Table 2**) which were deemed to be critical drivers of Chinese consumers' choices. The third attribute has details of COO and Brand together as brands are linked to specific country of origin. To facilitate respondents' decision-making processes, these factors were divided into two separate SPM designs.

Table 2. Attributes and attribute levels used in the choice experiment on soy milk and electric vehicle products.

	level1	level2	level3
Section A. Factors and factor levels for 'Soy milk' scenarios			
Sustainable label	organic	non-GM	CO_2 reduced packaging
price (dollar/100 mL)	0.8	0.57	0.54
brand name/COO	Kikkoman/Japan	Maeil/ Korea	Yili/ China
Section B. Factors and factor levels for 'Green vehicle' senarios			
Sustainable label	climate friendly	employee friendly	social projects[a]
price (dollar/ per unit)[b]	60,285	57,200	54,000
brand name/ COO[c]	BMW/Germany	NIO/China	Tesla/The US

[a]Social projects refer to the company activities which create social values; [b]China has introduced a new energy vehicle purchase subsidy standard in 2021: Based on the cruising range (CR)(km), the subsidy is 18,000 RMB (about 2777 US dollars) for greater/equal to 400 km; 13,000 RMB (about 2000 US dollars) for the CR between 300 km and 400 km. https://www.fastmarkets.com/insights/china-cuts-ev-subsidy-for-2021-market-downplays-impact-on-lithium-cobalt-prices; [c]EV model specification for three brands: BMW-iX3; NIO-ES6; Tesla-Model Y.

3.2. Random utility model (RUM)

To elicit preferences of respondents, we employed a discrete choice modeling framework. Lancaster Consumer Theory and Random Utility Theory provide a robust approach to understanding consumers' preferences[47]. In Lancaster's theory, a product is considered a collection of attributes, which are then used to derive utilities. Additionally, individuals are assumed to act rationally, choosing the most beneficial alternative. Observable deterministic and unobservable random components make up consumer utility in the Random Utility Theory. Thus, the probability of selecting a particular alternative from a choice set will be higher if it provides the most utility, as per McFadden's pioneering work in this area[48].

According to the following equation, the utility of individual *n* choosing alternative *i* from a finite set of *j* alternatives within the choice set C in situation *t* can be computed: $U_{nit} = V_{nit} + \varepsilon_{nit}$. Here, $V_{nit} = \beta' X_{nit}$ represents the deterministic component, where β' is a vector of structural preference parameters and X_{nit} is the vector of attributes pertaining to the i^{th} alternative. On the other hand, ε_{nit} denotes the stochastic component.

3.3. Multinomial logit regression analysis

According to the distribution of unobserved error term and the utility function, various models can be derived[49]. In the context of discrete choice analysis, the multinomial logit (MNL) model is commonly used. In this study, the MNL model was employed to estimate coefficients of three explanatory variables, namely SL, price, and COO/brand name. Factorial design generated 27 choice sets for each product type. As the respondents were asked to provide answer for two types of products, this may result in fatigue of responding. Therefore, we divided the 27 choice sets into half (i.e. 13 choice sets for SET I and 14 choice sets for SET II). Each respondent was given 27 choice sets including both product types. The estimates and the results of the pseudo-R-square test are presented in **Tables 3** and **4**, respectively.

Table 3. Attributes and attribute levels used in the choice experiment on soy milk and electric vehicle products.

Variable	Estimated Coefficient	Standard error
Organic-SL 1	0.04*	0.02
CO_2 reduced packaging-SL3	0.10***	0.03
Price $0.8-PR1	0.04*	0.02
Price $0.54-PR3	−0.02	0.03

Japan Kikkoman-BN1	−0.30***	0.02
China Yili-BN3	−0.78***	0.03

Signif. codes: 0 '***'; 0.001 '**'; 0.01 '*'. SL1: organic; SL2: non-GM; SL3: CO2-reduced packaging; PR1: $0.8; PR2: $0.57; PR3: $0.54; BN1: JAPAN; BN2: South Korea; BN3:CHINA.

Table 4. Parameter estimates for a multinomial logit model—Electronic Vehicle.

Variable	**Estimated coefficient**	**Standard error**
Climate friendly-SL1	0.07**	0.03
Employee friendly-SL2	0.10***	0.03
Price $60,285-PR1	0.06*	0.03
Price $57,200-PR2	0.21***	0.03
Germany BMW-BN1	−0.15***	0.03
China NIO-BN2	−0.08**	0.03

Signif. codes: 0 '***'; 0.001 '**'; 0.01 '*'. SL1: climate friendly; SL2: employee friendly; SL3: social projects; PR1: $60,285; PR2: $57,200; PR3: $54,000; BN1: Germany; BN2: China; BN3: US.

MNL Model:

$$V_i = \sum_{t=1}^{3} \beta_{i1t}\,\text{Price}_{it} + \sum_{t=1}^{3} \beta_{i2t}\,\text{Sustainable label}_{it} + \sum_{t=1}^{3} \beta_{i3t}\,\text{COO}_{it} + \varepsilon_i$$

The conditional indirect utility function of respondent n, denoted by V_{in}. ε_i represents the error term specific to each alternative choice. The magnitude of the coefficient estimates was used to measure consumer utility and purchase probability for each attribute. In this equation, the sign of the coefficient corresponding to each factor level indicates whether the probability of a Chinese consumer choosing a product profile incorporating that attribute increases or decreases.

4. Research method

China was selected as the focus market for developing a choice experiment design. Chinese consumption has become more quality-oriented and personalized in recent years due to rapid economic growth, and there is an increasing awareness of well-being and sustainable consumption[50]. More Chinese consumers are interested in 'conscientious consumption' to reduce harm to the environment or support public welfare[51].

Considering the size of China's market, sustainable consumption in China may have a significant impact on a global scale. Therefore, this study selects two product categories, soymilk and electric vehicles, which are considered to be reasonably related to sustainability in China. We develop a choice experiment design for these two product categories, incorporating specific factors and factor levels to address specific market conditions and social context. Study findings will shed light on how sustainable labels influence consumers' decision-making and provide empirical evidence for decision-makers. The next section presents a discussion of the literature review, followed by a section on the research method. The fourth section presents the empirical analysis and results, and the final section discusses the theoretical and practical implications.

4.1. Survey questionnaire

The survey comprises four components: general questions related to sustainable consumption, questions on socioeconomic profiles, questions on soymilk choices, and questions on electric vehicle (EV) choices. To evaluate the preferences of Chinese consumers, a choice experiment method was adopted for both product categories. Based on prior research, three factors, each with three levels, were selected for each product category, as summarized in **Table 2**. Specifically, sustainable labels, price, and brand with country of origin

(COO) were chosen as factors, with different levels for each product category. For the third factor (i.e. brands with COO), a well-known Chinese brand and two of the most popular foreign brands were selected for both soymilk and EV. Based on the retail prices of soy milk and EV products in six Chinese cities, the price levels were determined (second factor). To capture both main effects and two-way interactions between all attributes, a full factorial experimental design was employed, resulting in 27 choice sets (**Figure 1**).

4.2. Sample collection

A consumer survey was conducted in 2021 across six major cities in China, namely Beijing, Shanghai, Guangzhou, Shenzhen, Chengdu, and Xi'an, to collect data for assessing the proposed research model. There were 840 respondents in total, as summarized in **Table 5**. The sample had a median monthly per capita income range of 5000–10,000 yuan, with a nearly equal distribution of male and female respondents (49% and 51%, respectively). On average, the respondents held undergraduate degrees from universities and had comparable age distributions.

Table 5. Socio-economic profile of the sample respondents (n = 840).

Characteristics	**% of respondents**
Age group (years)	
<25	30.8
25–34	19.6
35–44	24.6
45–54	23.6
≥55	1.4
Sex	
Males	49.4
Females	50.6
Education	
Less than high school or high school	5
4 years or less post high school	4.2
Undergraduate	80.7
Graduate	10.1
Monthly income (T Y* (thousand yuan))	
≤5	11.7
5.1–10	40.5
10.1–15	29.3
15.1–20	11.1
≥20	7.4

5. Results and discussion

The multinomial logit (MNL) model was applied to analyze the SPM data with the Nnet package in R[52]. Two separate MNL models were estimated to investigate Chinese consumers choice behavior for soymilk (Model 1) and for electric vehicles (EV) (Model 2). The estimated coefficients for these two models are reported in **Tables 3** and **4**, respectively. Results indicate that the three selected constructs, namely Sustainability Label (SL), Price, and Brand Name, have statistically significant impacts on the Chinese consumers' choice behavior for both soymilk and EV. More specifically, findings suggest that Chinese

consumers prefer soymilk products with 'CO_2 reduced packaging' for SL, and 'Japanese' brand-Kikkoman (**Table 3**). In terms of EV choice, Chinese consumers show a preference for EV with 'Chinese' brand, Nio and SL with 'employee-friendly'.

5.1. Consumer preference for soymilk

Findings suggest that SL with 'CO_2-reduced packaging' has a stronger positive impact on Chinese consumers' intention to purchase soymilk compared to SL with 'organic'. According to Hao et al.[53], Chinese consumers have a favorable attitude towards green packaging and are willing to buy eco-friendly packaging to promote environmental protection and gain social recognition. Although Chinese consumers' awareness of green packaging may be low, their interest and purchase intention are relatively high. Therefore, Chinese consumers consider eco-friendly packaging to be more desirable than the organic content in a soymilk product. This trend could be linked to China's carbon-neutral policy which has raised consumers' awareness of CO_2-reduced packaging. The Chinese government has mandated carbon emission label for consumer products since 2018 to reduce greenhouse gas (GHG) emission in China[54]. Chinese government consider GHG reduction as one of the top priorities in terms of environmental management, as the pressure from global community towards Chinese government on carbon neutrality is heightening[55]. As part of the Paris Agreement, China has committed to reduce GHG emissions per unit of GDP up to 65% by 2030, and the Chinese government's environmental policy intend to engage not only industrial stakeholders but also consumers. For example, electronic consumer products in China are required to specify GHG levels, and consumers are increasingly conscious of GHG issues[56]. Findings from our study are consistent with previous research. Several studies claim SL to be an important determinant of consumers' choices in different countries[23,24,57]. Herbes et al.[57] reports that US and German consumers consider SL in their food purchasing, and Cho and Baskin[23] states that consumers consider SL for health and environmental benefits.

Organic label also has a significant positive impact on Chinese consumers' purchase of soy milk products. Previous studies suggest that consumers are motivated to purchase organic food due to health benefits or food safety issues[58.59]. Thus, healthiness, taste, and eco-friendliness are considered to be essential attributes of organic food for Chinese consumers[60]. As Chinese consumers are becoming more self-oriented, their choices are more influenced by egoistic motivations such as health benefits[61]. Furthermore, increase in the purchasing power of Chinese consumers enables them to purchase expensive organic products for food safety reasons. According to 2022 Organic Food Industry Report, China is now the fourth-largest consumer market for organic food products. Organic food accounts for 1–1.5% of the entire Chinese food market, up from 0.02% in 2006. Chinese consumers' preference for organic SL may be influenced by multiple factors, including health benefits and increasing purchasing power.

Our study has revealed an interesting finding regarding Chinese consumers' preference for soy milk products with foreign country of origin, particularly from Japan. Our results indicate that Chinese consumers have a more favorable attitude towards soy milk products with foreign origins compared to those with domestic origin. This preference for foreign origin may be attributed to several food safety scandals that have occurred in China in the past, especially in the dairy industry[62]. The most notable incident is the 2008 melamine-contaminated infant formula outbreak, which resulted in numerous infant deaths and illnesses, and subsequently led to a widespread lack of trust in the quality of Chinese dairy products among Chinese consumers[63].

Nearly 70% of Chinese consumers feel unsafe about food safety in their home country, according to a survey conducted by Insight China magazine and Tsinghua University's Media Research Lab, highlighting the significant negative impact of the food safety scandals on consumer confidence[64]. Chinese consumers are

likely to pay more for infant milk formula with American or European organic certification labels than for Chinese products[65]. In this regard, Chinese may be willing to pay more for milk products which is reflected in our finding. To address the food safety issue, multinational companies have invested in China's dairy industry by offering products with detailed labeling to signal quality and safety standards. Furthermore, several companies from the U.S., EU, and New Zealand have exclusive local agency relationship with local Chinese retailers such as Yihaodian, Tesco Plc[66]. Top Chinese dairy companies, such as Yili, Mengniu, and Bright, have formed joint ventures with foreign companies to meet Chinese consumers' demand for foreign-origin products[67]. Thus, Chinese consumers' preference for soy milk products with foreign brand label may be influenced by their previous experience of food safety incidents and their desire for safer products with higher quality.

5.2. Consumer preference for electronic vehicle (EV)

On the other hand, Chinese consumers show contrasting preference for COO of electric vehicle (EV) purchasing scenarios. Results indicate that Chinese consumers prefer EV brand with domestic origin over foreign origin. Traditionally, Chinese consumers exhibited a strong preference for foreign brands[67], and they prefer Western or Japanese brands for symbolic benefits such as sophistication, prestige, modernity, and novelty[68]. However, recent studies show that Chinese consumers' perception towards domestic brands become more positive with an increasing sense of pride in domestic brands[69].

The Chinese government launched a strategic plan "M'de in China 2025" in 2015 that aims to boost local industrial production and local value chain. The government has introduced various policy measures and financial supports to local industries which helped improvement in the quality of local goods and services. Products that are manufactured in China are perceived to be no longer synonymous with cheap, inferior, or unfashionable products[70], and Chinese consumers' perception towards local brands has become increasingly positive while their preference for foreign brands has decreased[71]. This trend in China's consumer market is distinctly evident in the case of EV products.

Findings indicate that Chinese consumers prefer EVs with "employee-friendly" SL over "climate-friendly" SL. When a product is produced in an "employee-friendly" enterprise, it is perceived to treat employees fairly and provides a working environment that fosters employee well-being. Chinese consumers are becoming more conscious of values such as employee welfare, diversity and inclusion, and employee development, which is primarily influenced by a recent labor policy.

China introduced a new labor law in 2019, called '996 work system', in which employees are expected to work long extended hours (i.e., 9 am to 9 pm, 6 days per week), and several major companies in China have adopted this system, which became a major controversial social issue. In response to the negative consequences and public response, the Chinese government amended this labor law in August 2021[72]. Introduction of this labor law has heightened public's interest in employee welfare, and company's social responsibility. The Chinese government has another major policy initiative called "common prosperity" which includes employee welfare issue. This policy promotes the remuneration of workers in China and includes several details of employee-friendly measures. Thus, labor policy in China has gained major attention from the public, and employee welfare is considered to be an important social value which is shared by the general public. In this context, Chinese preference for SL with 'employee-friendly' may reflect public's interest in employee welfare in China.

6. Conclusions

6.1. Research contributions

Our research makes a twofold theoretical contribution to the literature. Firstly, we employ a choice experiment approach to examine Chinese consumers' choice behavior for sustainable products. This approach allows us to assess multiple critical factors that are important for purchasing two sustainable products specific to the Chinese market. To reflect the market situation in China, we selected major domestic and foreign brands as factor levels through a pilot study and a review of extant literature. Additionally, we selected factors and factor levels for sustainability labels differently for each product category to reflect the critical issues unique to each industry sector. While past research has focused on the impact of sustainability labels as a single factor on consumers' purchase intention and behavior, our study extends the importance of specific sustainability attributes that may have varying effects on consumers' choice behavior by including sustainability as a factor with variations in sustainability attributes (i.e., factor levels).

Secondly, we selected two of the most relevant consumer products for Chinese consumers, namely soymilk and EV, which are perceived to be closely associated with sustainability. We separately developed the choice experiment design to accommodate the different circumstances of each market sector. Our findings show that the same factor (i.e., brand/COO) has different outcomes, as the preference for a domestic brand is perceived and valued differently for the beverage versus automobile categories. This highlights the importance of designing choice experiments according to specific market sector conditions and not generalizing consumers' choice modeling.

6.2. Practical implications

The findings of this study provide specific insights into Chinese consumers' preferences for each important factor in each product category. For food and beverage products, food safety is identified as a critical factor for determining the preference of foreign brands, while the opposite result is observed in the automobile sector. In addition, sustainability labels need to be tailored to each product category, as the 'CO2 reduced' label is found to be the most preferred for food and beverage products compared to other labels such as 'organic' or 'non-GM'. This indicates that Chinese consumers place a higher value on the 'environmentally friendly' aspect rather than the 'health benefit' when it comes to food and beverage consumption.

Moreover, 'employee-friendly' is found to be the most preferred attribute by Chinese consumers compared to 'climate-friendly', as labor laws play a crucial role in shaping the perception of Chinese citizens in labor-intensive manufacturing sectors like automobiles. Marketers need to understand that sustainability communication needs to be tailored to specific social contexts and circumstances. Social aspects of sustainability play a critical role in determining consumers' motivation and willingness to participate, and therefore commonly shared values of a particular market need to be thoroughly assessed, identified and communicated through labeling and promotion of products.

The outcomes of this study also support effective communication through labeling, education programs, and promotion of government policies can facilitate consumers' decisions about sustainable consumption. Marketers may need to consider providing clearly defined and descriptive details of products or traceable links to labeling on their websites, as sustainability labels, brand, and country of origin evidently affect consumers' choice decisions in China. This can help consumers make informed choices in the marketplace and increase their confidence in sustainable behavior. In the long run, transparency in the information related to sustainability can engage consumers in sustainable consumption.

6.3. Limitation of the study

This study applied a choice experiment with stated preference method (SPM), which identifies three choices for three factor items (i.e. Price, Sustainability Label and COO/Brand). The three levels for each factor include various options which reflect the market conditions. For example, the sustainability label (SL) factor varies with three levels-organic, non-GM and CO_2 reduced packaging which are associated with different environmental benefits. Due to the limited choices, we can include in the choice experiment approach, non-sustainable option is not included as an option. In the future study, this can be explored to evaluate consumers' response to non-sustainable option in comparison to sustainable options. In addition, this study assesses the survey data which is collected from six large cities in China which have comparable socio-demographic profiles. Thus, the dataset is from a relatively high-income group, and findings is missing information on consumers from lower income groups. Future study can expand the dataset for other socio-demographic groups to compare the choice differences.

Author contributions

Conceptualization, RBK and JL; methodology, JL; software, JL; validation, RBK and JL; formal analysis, JL; investigation, RBK and JL; resources, RBK and JL; data curation, JL; writing—original draft preparation, RBK and JL; writing—review and editing, RBK and JL; visualization, RBK and JL; supervision, RBK; project administration, RBK and JL; funding acquisition, RBK and JL. All authors have read and agreed to the published version of the manuscript.

Conflict of interest

The authors declare no conflict of interest.

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